

A text dump on the indomistas

Último Reducto, Ted Kaczynski, etc.

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1. Texts on the concept of Wild nature and ecocentric theory

In this section we include texts that deal with the concept of wild nature and its value. Practically all of these texts about the wild are the work of conservationist authors. And most of these authors are American. However, despite the specific idiosyncratic details, we believe that, in general, the content and message of the texts can be of interest and benefit to intelligent readers in any country.

On the other hand, almost all conservationists are unfortunately idealists who are completely ignorant of the true development processes of social systems and of the fundamental factors that influence and determine them (which are mainly material factors). These conservationists believe that ecological problems and techno-industrial society are the product solely or mainly of the assumption by society of wrong values, attitudes and ideas (such as anthropocentrism or the desire to dominate and control) and that, for example, Therefore, for everything to be fixed, what you have to do is mainly try to change the values and ideas of society, that is, educate and raise awareness among people and preach certain ethical behaviors both individually and socially.

On the other hand, the few conservationists who are more realistic, practical and materialistic and who do not allow themselves to be carried away (so much) by idealistic daydreams, choose to focus on defending the legal protection of Nature without often entering into questioning and even less reject the techno-industrial society.

Therefore, if we include these texts on this page, it is not because those of us who administer it agree exactly with the strategy, the purpose or the philosophical positions of their authors. In reality, although we consider the conservationist purpose of protecting Nature laudable, we believe that legal protection is insufficient and ineffective to save ecosystems and the wild biosphere in the long term. In the long run, the physical existence of techno-industrial society is incompatible with the conservation of Wild Nature on Earth, since techno-industrial society inevitably needs to destroy and subdue Wild Nature in order to exist (that is, to extract the matter and energy it you need and to get rid of your waste; or simply to get the space it takes up). For one to survive and prosper, the other must necessarily perish; there is no middle ground or compromise solution possible. And most conservationists (and people in general) either seem unaware of this physical fact or seem to prefer to ignore or even delude themselves about it.

In any case, what seems most interesting to us about conservationism and makes us believe, despite everything, that these texts are worthy of being published here is their defense of the basic value that inspires them: the autonomy of the non-artificial, that is to say , wild nature.

As for the rest of the values and ideas defended in these texts, there is everything, but they do not always seem the most appropriate. In this regard, normally, we accompany each of the texts with a critical presentation commenting on some of the most important points on which we do not agree with the authors.

- Some questions to Dave Foreman. By David Skrbina and Dave Foreman.

- Welcome to the Pleistocene, your home. The ecological philosophy of Paul Shepard.
By Tomislav Markus .
- The wild, cyborgs and our ecological future. By George Sessions.
- The authentic idea of wild Nature. By Dave Foreman.
- Intimate places. By John Revington.
- Deep Confusion in "Intimate Places". by AQ
- Against the social construction of wild Nature. By Eileen Christ.
- Where is Earth First headed!? By Dave Foreman.
- The wild lands of History. By Donald Worther.
- Is nature something real? By Gary Snyder.
- Evaluate the natural character in the Anthropocene . By Ned Hettinger.
- Wild nature: what and why? By Howie Wolke.
- The myth of the humanized pre-Columbian landscape. By Dave Foreman.
- Criticism and alternative to the idea of wild areas - Wild areas, today more than ever. By J. Baird Callicott and Reed Noss, respectively.
- Ecological forest exploitation or protection? By Ken Wu.
- Why the productive landscape does not work. By George Wuerthner.
- Earth is not a garden. By Brandon Keim
- Wherever man is a visitor. By Dave Foreman.
- Wild nature and human settlement . By David Johns .
- The conservation dilemma. By David Ehrenfeld.
- The shaky terrain of sustainable development, The ecology of order and chaos and Restoring the natural order. By Donald Worster .
- The wild character and the defense of nature . By Jack Turner.
- The sustainability of wild nature . By Ralph Buckley.
- On no map . Interview with Jack Turner conducted by Leath Tonino.
- The value of a vermin . By Donald Worther.
- Respect the autonomy of nature in relation to humanity. By Ned Hettinger.
- Human beings and the value of the wild . By Bill Throop.
- The importance of wild nature. by AQ
- A definition of the wild character. By Lawrence J. Cookson.
- Wild nature . By Theodore John Kaczynski.
- Fragment of a letter to an anonymous person about Wild Nature, deep ecology and more . By Theodore John Kaczynski.

A FEW QUESTIONS TO DAVE FOREMAN

by David Skrbina and Dave Foreman[1,2]

DAVID SKRBINA (S): When it comes to values, contrary to what happens in the United States, Australia, or the Scandinavian countries where there is a, so to speak, “culture of valuing wild lands”[616] widely accepted, in countries like Spain they face the problem that the concept that “Nature *wild*”[617] is something valuable practically does not exist. They have been living in a highly complex civilization for many centuries and large areas of wilderness have been gone for so long that most people seem unable to understand (and therefore defend) the importance of wilderness, its existence and the natural laws that maintain them. In fact, practically all Spanish environmental groups are more interested in achieving social justice than in protecting wild nature.

What do you think are the reasons for this huge difference between, for example, Spain and the US? And, more importantly, can you think of a way to overcome this problem?

DAVE FOREMAN (F) : Well, this is a very good question, a very deep question. It has a lot of levels when it comes to answering it. The key is that they need to start talking about wilderness and development. Look, one of the things we’ve failed at is natural history. Getting people to go out and watch the birds, identify plants, and that kind of thing. This is unquestionably a key piece to build a movement in favor of Wild Nature. That is where I think they can start. That would be a good task; take an inventory as in my book, *The Big Outside* (1998).[618] Where are the wild areas in Spain? Where are the mostly wild places? Make a list of them - map them. Who do they belong to? what we can do with them? How wild are they? What wildlife inhabits them? Are there mature or unlogged forests (primary forests)? Look for that kind of information.

My friends in the eastern United States began looking for remnants of old-growth forests, and the more they searched, the more they found. Actually, it was my closest collaborator, John Davis, and his mother, Mary Davis, who started it and wrote a book on Eastern Old-Growth Forests [*Eastern Old-Growth Forests*, 1996]. And they

had contact with all kinds of people, and they identified just over 2,000,000 acres¹, made up of bits and parcels, including a piece of land of over 20,000 acres² in the Adirondacks³. Some of those trees were 700 years old; Somehow, they had gone uncut. I find that fascinating. Well, what about Spain? A national park in the south of Spain, if I remember correctly, has a lot of waterfowl, and I think it is also the main refuge of the Iberian lynx, but what else is there? What is in the Pyrenees? The Pyrenees were the last refuge of the Neanderthal!

One thing I would say to the people of Spain about Wilderness is that they need to come up with a word like “wilderness”, and in order to do that they need to know the etymology of the word “wilderness” in Old English - it meant “land self-governed”; “the home of the animals that governed themselves”⁴. How would you say that in Spanish? Don’t say “wilderness”, say “self-governed land” in Spanish.

S: You have publicly shown tolerance and even sympathy for some theories and struggles related to “social justice”, such as feminism. Don’t you think that, however, many environmental organizations have ended up being ruined and perverted, among other reasons, due to the influence of currents in favor of “social justice”? I would like to know what you think today about this. Do you still believe that leftist or humanist struggles (that is, for “social justice”) are compatible with the defense of Wild Nature?⁵

F: I think you exaggerate my sympathies for those ideas. And in the book I’m finishing up now *Take Back Conservation*⁶, one of the things I criticize is the way in which the “progressives” on the left of the Democratic Party have of conservation in the US, something we could call the “environmental stereotype” - you have to be liberal democrats, vegetarians, anti-guns and anti-hunting, etc. They link all these other things to conservation, but they don’t necessarily have to go together. I also see political correctness as one of the worst things about the environmental stereotype, and I’ve argued that what we need to do is try not to be beholden to the Democrats. Of course the Republicans are pretty much nuts these days. But there are people, who we could reach, who talk about some traditional conservative values, such as devotion, posterity, prudence, responsibility - all those kinds of things that won’t make us look leftist.⁷

¹ In the original, Foreman read “a couple of million acres” (1 acre = 4046.87 m²). Since the acre is not a commonly used measurement unit in Spain, it has been decided to translate it directly into hectares. *N. of the trad.*

² 50,000 acres in the original. *N. of the trad.*

³ Massif mountain located in northwestern New York state. *N. of the trad.*

⁴ Foreman uses the English expressions “self-willed land” and “self-willed animals”. “Will” can mean “will”, “desire” or “order”. The expression “self-willed”, in this case, refers to having one’s own will, to act *on their own accord*, not to follow the orders or wishes of others, that is, to govern themselves, to be autonomous. *N. from trans.*

⁵ “Wild Nature” in the original. *N. of the trad.*

⁶ Dave Foreman, *Take Back Conservation*, Raven’s Eye Press, 2012. *N. of the trad.*

⁷ In the United States, the two largest parties are the Democrats and the Republicans. In general, supporters of the Republican Party view those of the Democratic Party as leftist and progressive, and

S: [...] As long as local populations can continue to exceed the carrying capacity of their environment using modern technology and the global trading system (which itself depends on modern technology), can the human population be reduced *without* big organizations controlling people and *without* using complex medical technology (and without all the impact on wild ecosystems that both imply) ?

F: Well, I think in the '70s, in the United States, we kind of had that discussion about population, but then we were overwhelmed by increased immigration. You see, many people of my generation decided not to have children. I can easily sit back and quickly remember 100 people I know, people of my generation who didn't have children. In many cases it was a very conscious decision. And one of the things that we need to do, and there are people in New England who are working on it and they have a website, is to explain the quality of life that a couple without children can have. I have nephews and nieces, I have no children. However, I take my nieces and nephews whitewater rafting and the like. So one can mount it in many ways.

Nowadays, I believe that society and technology push women, both in developed countries and in the third world, to have more children than they want. And we see countries like Japan where the population is declining as young women have been liberated from an inferior position in society and have decided that what they want is something more important than having a handful of babies.

S: So, the main thing is that it can be done without a big bureaucracy controlling people.

F: And besides, I think it's going to happen anyway, whether we try or not. Look, we have 7 billion large mammals that can practically come into physical contact with everyone else in 48 hours, via air travel. We are exposing ourselves to a highly deadly pandemic. And I think it's inevitable that this will happen. I don't know when, I don't know what it will be. But that is precisely the way ecology works. We are perfect prey for a predator, and that predator is going to be very, very small.

S: Right - there are these debates about which catastrophe is going to hit us first: pandemic, global climate change, food supply collapse, water problems...

F: I think in many ways they will come *together*. But who knows?

supporters of the Democratic Party view those of the Republican Party as right-wing and conservative.
N. of the trad.

S: As far as I know, you defend the “Pleistocene Rewilding”⁸. It is obvious that “Pleistocene Rewilding” is based on the Pleistocene overkill hypothesis⁹ but isn’t it unwise to propose something that can have a large ecological impact based only on an unproven hypothesis?

F: In the latest issue of *Science* magazine there is an article with strong evidence that the Pleistocene extinction in Australia was entirely caused by humans.¹⁰ And what we’re finding here in the US and Canada, with some studies of pollen collecting on the bottom of lakes and things like that, is that the vegetation changed *after* people arrived here and *after* the megaherbivores were exterminated. And so, you’re really starting to see that the vegetation changes were caused by the disappearance of the megaherbivores, and not that the vegetation changes caused the megaherbivores to disappear. Just the other way around.

From another angle, we can see how a few Spanish horses escaped into the United States, and within about 50 years, there were 2 million Great Plains horses riding wild. And there were still 60 million bison left, 40 million pronghorn¹¹, 10 million elk¹². This means that the ecological niche was still there for those horses.

And there is other research that has been done with plants like the Osage orange tree¹³ and other Central American plants like avocados, and shows how the large herbivores are the ones that spread their seeds and sow them in a large pile of manure as a seedbed. And with the disappearance of these megaherbivores, suddenly the distribution area of these types of plants was reduced. Actually the only wild animal that spreads avocados in Central America today is the jaguar. Horses and cattle have been doing it too, but anyway, we can see from the impact on the vegetation what the loss of megaherbivores has done.

⁸ The so-called “Pleistocene rewilding” is a type of “rewilding” (“reasilvestramiento” or “recovery of the wild character” in Spanish). The “rewilding” in conservation biology refers to those actions aimed at allowing the recovery of ecosystems so that they approximate as much as possible to the state they had when they were wild. The “Pleistocene rewilding” defends that certain ecosystems ceased to be wild at the end of the Pleistocene (of the last glaciation) due to the disappearance of a large part of the megafauna, supposedly as a result of predatory pressure and competition exerted by human beings from the Upper Paleolithic. Therefore, the recovery of the wild state of these ecosystems would go through recovering the fauna that disappeared at the end of the Pleistocene (some even defend the use of genetic engineering for this), or failing that, replace the extinct species with still existing species that are phylogenetic and ecologically close to them (for example, introducing current elephants into areas where mammoths and mastodons are supposed to be, current lions where cave lions are supposed to be, etc.). Pleistocene rewilding is a highly controversial proposal among some ecologists and conservation biologists. *N. of the trad.*

⁹ Hypothesis according to which most of the large mammals that became extinct at the end of the Pleistocene did so because of hunting by Upper Paleolithic humans. *N. of the trad.*

¹⁰ “The aftermath of megafaunal extinction,” S. Rule *et al.*, *Science* (March 23, 2012). *N. of the trad.*

¹¹ *Antilocapra americana*. *N. from trans.*

¹² *Cervus canadensis*. *N. from trans.*

¹³ *Machura pomifera*. *N. from trans.*

And so, there are some who say “well, let’s do an experiment with a few elephants - they would help deal with mesquite¹⁴ encroachment on desert prairies. Or with a few camels. I mean, let’s do a good experiment on the ground. Let’s see what the impact would be of introducing some replacement megaherbivores.”

There is a place in northeastern New Mexico that has the largest herd of Przewalski’s horses¹⁵ in the world - more than 300. And I’ve been there seeing them. And on the high terrace, with the Rocky Mountains rising behind, they looked just like the horses in the cave paintings of Europe, and that’s a phenomenal thing. Another friend of mine has been raising bison on a restored cattle ranch, and is discovering the ecological impact of bison and how different they are from cattle. Today the cattle have almost eliminated all the native cacti, and have cleared the thicket of junipers. In fact, they even enter streams and wallow in them, slowing headwater erosion by smoothing out the slope.¹⁶ All those amazing things bison do to make things better, while cattle make things worse.

With all this knowledge, it would really be nice to go one step further. Let’s put all the animals here and see what happens. Because when I was in South Africa, which looks a lot like the American Southwest, I saw 24 species of ungulates out of 42 species. How many do we have here in the US? Seven! And they are all feeding in different parts of the ecosystem. So there really is room for more species. If we did that kind of experiment, we would have more biomass on the ground, with more species than just a few. Until we do the experiments we won’t know what will happen.

S: To complete the question: even if we put this aspect aside, and assume that the Pleistocene overkill hypothesis refers to a really proven fact, wouldn’t it still be too risky? ? Civilized solutions to problems (especially in the case of modern solutions) are often worse than the problems themselves, that is, instead of actually solving the problems, they often create other new and bigger problems, or make some of the pre-existing problems worse. .

F: I generally agree with that. It would have to be done in specific places, as a controlled experiment. The media has broken the news that we want to simply release lions. No. You find a guy with about 400,000 acres¹⁷ in Texas who is willing to experiment, and you really have some of the best ecologists to run the experiment, take measurements, and see how things turn out. You need some predators to get everything moving. What we have learned from the wolves in Yellowstone is not that they eat elk, but that they make them move. The elk, instead of getting fat and lazy, lying down

¹⁴ Legumes of the genus *Prosopis*. Some scientists believe that their uncontrolled expansion in certain areas of North America is due to the fact that the herbivores adapted to consume them disappeared at the end of the Pleistocene. *N. of the trad.*

¹⁵ *Equus przewalskii*. *N. of the trad.*

¹⁶ “They actually even go into a larger streams and horn-up the beginning of the erosion of the head wall and smooth it out” in the original. *N. of the trad.*

¹⁷ “A million acres” in the original. *N. of the trad.*

in the river beds and devouring all the willows, had to hide in the logdepole¹⁸ pine forest. And that allowed the willows to return to the streams. There is a wonderful study about this by some researchers at Oregon State University.

S: A lot of people who advocate for conservation and/or rewilding usually do so because they love Wilderness¹⁹, wildlife, wilderness areas and lands, wild things and the wild character²⁰ of them. And, normally, conservation implies and needs the management of at least some parts and aspects of the ecosystems that are being protected. Is there not an intrinsic contradiction between the "wild character"

and "*management* to protect Nature"? If you need to manage an ecosystem to make it or keep it "wild", then is it really wild?

F: That's right. My next book, which I am writing, will deal with this topic. It is the big difference between John Muir²¹ and Gifford Pinchot²², and using Pinchot's terminology, I call it "recursism"²³. Basically it is the ability to manage resources to extract the maximum value for man without degrading them. Whereas the idea of nature conservation is to protect wild things. And there is a fundamental difference between the two "conservations".

Grassroots groups are trying to protect wilderness, while the US Forest Service and other departments that manage wilderness are doing so to impose *human* will. For me the fundamental question is, "whose will?" Do we allow the will of the earth to prevail or do we impose the human will?²⁴

These are really good questions, and I may use them in my new books. They are very brainy. The questions are very different from what I expected - much deeper.

S: In the context of these questions there were some other names coming up - people like Derrick Jensen²⁵. What do you think of him?

F: I haven't read anything by Jensen in a long time. He got really mad at me after the Earth First! split. Maybe he thought I was rude to Mike Roselle²⁶, I don't know. I know that you have built a reputation as a critic of technology and modernity.

¹⁸ *Pinus contorta*. *N. of the trad.*

¹⁹ "Wild Nature" in the original. *N. of the trad.*

²⁰ "Wildness" in the original. *N. of the trad.*

²¹ (1838-1914) Scottish-born American naturalist. An early advocate of wilderness preservation. Founder of the Sierra Club. *N. of the trad.*

²² (1865-1946) American politician and forester. Defender of scientific forestry and conservation and the controlled use of natural resources for the benefit of human beings. *N. of the trad.*

²³ "Resourcism" in the original. *N. of the trad.*

²⁴ In the original Foreman uses the term "will". See footnote number 10 of this interview. *N. of the trad.*

²⁵ American anarcho-primitivist. Years ago, Jensen interviewed Foreman in his book *Listening to the Land* (Sierra Club Books, 1995) and we prepared a question for him about one of the answers Foreman gave in that interview. Skrbina, however, did not ask him our question, but, as it turns out, simply asked him what he thought about Jensen. *N. of the ed.*

²⁶ One of the founders, along with Foreman, of Earth First! Roselle was very interested in leftist issues and "social justice" and this caused him to have serious friction with Foreman, which ended with the abandonment of Earth First! by the latter. *N. of the trad.*

S: Well, I saw him speaking in person not long ago - he was in Michigan. It was a bit disappointing: a kind of disjointed, incoherent, jokey, and not very serious talk. However, he brought up the important issue of revolution versus reform. And his answer was, that he supported *both*! Now, that seems like a contradiction to me - one is trying to tweak the system and the other is trying to break it down. How do you see it?

F: I'm afraid revolutionaries almost always become what they rebel against. The result is not good. I have a low opinion of human beings. I don't think they are capable of bringing a revolution to fruition. I think the most successful revolution was the American revolution, and its field of action was really limited. And yet it's been pretty much subverted by big business and that sort of thing.

S: Okay, but the technology system is different. It is not about taking power, but what you simply want is to make it sink. And then those who survive will go on again as hunter-gatherers.

F: What I see is that nobody "rebelled" against the Soviet system, and yet it collapsed because of its own internal contradictions. In many ways, the Soviet and Western systems are based on industrialism and exploitation, and because the Soviets were more ineffective and incompetent, the former collapsed.

S: Is it accurate to say that you would support industrial collapse? Would you see it as a possible outcome?

F: I think industrial collapse is something that is going to happen. In the long term it is a positive thing. And since it's inevitable, it's probably best if it happens sooner rather than later.

S: So shouldn't you take proactive action to help make it happen sooner rather than later?

F: If you tried to do that, couldn't you end up ruining everything? I just don't trust that we'll be able to do it properly. My misanthropy - my atheistic Calvinism - prevents me from believing that no group of people, no matter how well-meaning, intelligent, or ethical, are capable of solving these overwhelming institutional problems of mass civilization.

S: So what you are saying is that this task is simply beyond our capacity and therefore we should not focus on it since there is no possibility of contributing effectively - isn't that basically ? Instead, we should focus on... what?

F: My opinion is that the system is going to go under, one way or another, on its own. My job is to maintain as many structural units of future evolution as possible. I believe that evolution is the true heart and essence of wild things and wildness²⁷.

²⁷ "Wildness" in the original. *N. of the trad.*

Presentation of “WELCOME TO THE PLEISTOCENE, YOUR HOME. THE ECOLOGICAL PHILOSOPHY OF PAUL SHEPARD”

Until a few months ago (we wrote this in April 2011), when the English original of this text came into our hands, we were completely unaware of who Paul Shepard was. The text pleasantly surprised us, because, if what Tomislav Markus, its author, says is a faithful summary of Shepard’s ideas, many of these ideas coincide with those that some of us have developed independently.

Many, but not all. According to Markus, Shepard’s thinking is materialistic, but while generally true, this statement is more than questionable in some of the more abstruse aspects of his philosophy. As for example, when Shepard criticizes the concept of history (see for example, “A Post-historic Primitivism”, *The Wilderness Condition, Essays on Environment and Civilization*, ed. Max Oelschlaeger, San Francisco, CA : Sierra Club Books, 1992, point 1: “The Problem of the Relevance of the Past”). It is difficult to see where materialism, or just common sense, is in the midst of all this gibberish of abstract speculations about the cultural notion of time, mythical thinking, etc. From what little we have read of Shepard’s work (the text quoted above), it gives us the impression that his thought is left over from a good part of ramblings and philosophical speculations. This makes Markus’s article appear to be a much more accessible and intelligible medium when it comes to getting to know Shepard’s thought in broad strokes than direct reading of Shepard’s texts. Although there is some part of the text in which Markus perhaps should have been less sparing in words. For example, when she relates feminism to moral vegetarianism without explaining that relationship.

Shepard’s thought, as Markus presents it, differs in many respects from the more usual primitivism (of which John Zerzan is a model, for example) in its scientific materialist basis and also, probably largely as a consequence, in that it is not so influenced by leftism or humanism. However, Shepard does not always escape the idealization of hunter-gatherers, as when he claims that among hunter-gatherers there was no war or social inferiority of women. (See in this regard, for example, pages 297-

299, 303-305 and 319-322 of the book *Our Species* by Marvin Harris, Alianza, 1995. Harris is not exactly an anthropologist who presents the primitive so that their customs are distasteful to prevailing values in industrial society. Quite the contrary. And yet, despite trying to soften it with counterexamples, he cannot deny the obvious fact that among the nomadic hunter-gatherers there were sexism and war). Or when he attacks the hypothesis that overhunting was the cause of the extinction of the Pleistocene megafauna on the grounds that it is an ideologically charged hypothesis that tries to demonize hunter-gatherers. The weakness of this hypothesis, if it existed, would lie rather in the lack of conclusive scientific evidence for it.

As for Markus's conclusions, some of his claims about modern hunting are more than questionable. When he insinuates that modern hunters all belong to the "industrial middle class" he does not clarify what he means by this expression. And when he implies that they only hunt in national parks, he ignores the fact that in reality this type of hunting (in game reserves) is a minority among the multitude of modern hunters who hunt almost everywhere, except precisely in national parks and other protected areas. Not to mention the suspicious contradiction of stating that hunting "only acquired significant importance with the appearance of the anatomically modern *Homo sapiens sapiens*, too late to form part of our genetic heritage." The appearance of the anatomically modern human being meant, by definition, a change in our genetic inheritance (that is precisely what makes species differ from each other). If hunting, according to Markus, only had significant importance with the appearance of our species (something more than debatable and not as consensual as Markus affirms), it is not clear why the human genome in that period had time to change to form a new species. species but did not have time to change to adapt to a hunting way of life.

WELCOME TO THE PLEISTOCENE, YOUR HOME. THE ECOLOGICAL PHILOSOPHY OF PAUL SHEPARD.[1014]

By Tomislav Markus.¹

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I. Main features of Shepard's ecological philosophy.

In Shepard's early philosophical work² the idealistic point of view predominated, in which he gave priority to ideas and worldviews. So, he thought that the preservation or destruction of nature depended mainly on personal and social cosmology.³ In the book *Man in the Landscape* (1967), Shepard analyzed different ways of representing the organic environment and nature in European and American art and literature from the 15th to the 20th century. In the book his main conviction was that an adequate vision of the natural world - one that recognized the biological and ecological continuity of man with respect to other species - was the fundamental condition for improving the ecological situation.⁴ In the famous article "Ecology and Man: A Viewpoint" (1979), Shepard defended an ontological extensionism, an understanding of the human self as a small part of the natural world or the vision of nature as an extension of the self.⁵

Shepard's initial idealistic convictions or belief in "consciousness shifting" quickly disappeared from his later work. In the foreword to his last book, Shepard mentioned his disagreement with the ecological movement in the early 1970s and the disappearance of his faith that an ecology based on philosophy could serve as the basis for better ecological behavior.⁶ In *Tender Carnivore and the Sacred Game* (1973), he consistently defended a materialist position that prioritized material factors -population, technology, standard of living, genetic adaptation, etc.- when determining the ecological state of a human society. A fundamental thought in all of Shepard's work since the early 1970s is his conviction about the destructive and pathological character of civilization. Neolithic domestication and civilization meant the abandonment of the hunter-gatherer life that is appropriate to the human biogram and evolved human nature. Already in his first book, Shepard underlined the importance of the deep human evolutionary past without which subsequent civilized history cannot be explained. This evolutionary past implies our firm connection with other species and with the

² Paul Shepard (1925-1996) was an American biologist, anthropologist, and ecological philosopher. In its beginnings, it was working in several national parks. From 1970 until his retirement in 1994, Shepard taught classes, as Professor of Natural Philosophy and Human Ecology, at California Pitzer University and Claremont College. Long ignored, his work is frequently mentioned, sometimes positively and sometimes negatively, in contemporary ecological philosophy and psychology, as well as other branches of human ecological theory (for example, Nash 1989, 2001, Oelschlaeger 1991, Turner 1996, Rubin 1998, Peterson 2000, Taylor 2000 and 2009, Kidner 2001, Fisher 2002, Mason 2005, Evans 2005, Fellencz 2007, Sale 2007, Bender 2003 and 2007, Rochberg-Halton 2007, Kheel-Zimmergens-Hamjorn 2008, and 2009). This article is an abridged version of an article that appeared in Croatian, "Dobro dosli kuci u Pleistocen: ekoloska filozofija Paula Shepada", which is also available on our website ([<http://www.isp.hr/~tmarkus/>][www.isp.hr/~tmarkus/]).

³ Shepard 1999:51.

⁴ Shepard 2002.

⁵ Shepard 1996:111-122.

⁶ Shepard 1998b:2.

natural world as a whole. The wild⁷ is not only outside, in wild habitats and species, but also inside, in our wild genome and our biological heritage. Shepard wrote that the Pleistocene wilderness lives within us even today, despite great changes in human social organization and ways of life.⁸ That means that man can be civilized, but he cannot be domesticated.⁹

Shepard's theory of biosocial discontinuity, a crucial component of human ecology, cannot be reconciled with the myth of historical progress (a central metanarrative of all modern secular ideologies) nor with the view of civilization as "elevation and achievement". For Shepard, nothing is further from the truth than the myth of historical progress. In Shepard's opinion, the abrupt (from a deep evolutionary perspective, that is) emergence of domestication and civilization was the main cause of many man-made [ecological] problems and much human misery. Human intelligence, suited to life in small groups, turned out to be nonfunctional and ill-adapted to overcrowded agrarian and urban environments.¹⁰ Man can survive in the civilized environment, but only at the cost of progressively reducing the quality of life and creating many ecological and social disturbances.¹¹ The conviction that man is his own work is an ideological construction, without scientific basis. Social forms are not unlimited, since men can create society only within the restrictions set by their evolutionary past.[1026]

Human beings, like all other beings, need the concrete environment in which their fundamental psychological and physiological characteristics have been formed over eons of evolution. But the recognition of evolutionary limits is not welcomed by the modern ideology of unlimited expectations.¹²

Shepard wrote that culture does not replace biological evolution - for him, the expression "cultural/social evolution" is an inaccurate or misleading analogy - but it can distort it because of its excessively fast pace, as has happened in recent human history. Chaos, loneliness, anomie, sporadic violence, isolation, overpopulated and polluted environments are typical features -or different forms of collective pathologies- of all cities in all civilizations, symptoms of the very bad adaptation of man to civilized conditions.¹³¹⁴ Men are Pleistocene beings who need, now and always, wilderness and open spaces, but, under civilized conditions, they are trapped in an overpopulated,

⁷ "Wildness" in the original. The translation of "wildness" would be something like "the wild character" of something, although in certain contexts it can mean "wild nature" in general. Throughout this text, for short, it has always been translated as "the wild". *N of the t.*

⁸ Shepard 2002:30-31 and 97. It is to this interpretation, which implies a radical separation between human nature (or the genetic adaptation to hunter-gatherer life) and the social macrodynamics of recent human history, which we call biosocial discontinuity theory. See, Markus 2008 and 2009, for more information.

⁹ Shepard 1998c:15-16.

¹⁰ Shepard 1998c:98 and 227.

¹¹ Shepard 1998c:113.

¹² Shepard 1998b:135 and 1998c:122.

¹³ Shepard 1998a:XIX and 93-108 and 1998b:137.

¹⁴ Shepard 1998a:XIX and 93-108 and 1998b:137.

biologically impoverished and ecologically devastated environment.¹⁵ Shepard has criticized typical claims about the domestication of man since humans, unlike domestic animals, were not subjected to sexual selection.¹⁶ Humans today are as savage as their Pleistocene ancestors from 10,000 years ago.¹⁷ Genetically, we are a Pleistocene wild species that can survive in very different environments, but only at the cost of many problems and a low quality of life.¹⁸ According to Shepard, the wild within us is the best part of us, as appreciating our evolutionary heritage is the primary requirement for human happiness and well-being. Some cultures are better than others depending on how much they appreciate our natural context and our evolutionary past, respectively.¹⁹ Human beings can create very different cultures - and have been doing so for the last few millennia - but there is a catch. Men cannot control the consequences of their behavior and not every culture can satisfy basic human needs equally well. Not all cultures work equally well.²⁰

Shepard wrote very often and extensively about hunter-gatherers, as he believed that this way of life is our natural evolutionary context, suited to basic human needs. As early as the late 1960s, he wrote that the existence of hunter-gatherer societies for so many thousands of years is proof in some way of their success and that all of recent human history, beginning with Neolithic domestication, may be a downhill road.²¹ According to Shepard, among the hunter-gatherers there was no war, state, social class, great economic and political inequalities, pollution, or other of the human-caused problems that are typical of civilized societies. Civilized men transfer their problems to "savages" and "primitives." The good or the bad savage are ideological constructions: the first is a distorted view of our evolutionary past and the second is a

¹⁵ Shepard 1997:317-319 and 1998b:137.

¹⁶ Here, as in some other parts of the text, it is not clear what the author is referring to or if there is simply a writing or translation error (the author is Croatian and does not speak English very well despite write in this language). In this specific case, the phrase would make much more sense if instead of "sexual selection" it said "artificial selection". *N. from t.*

¹⁷ Shepard 1996:126.

¹⁸ Shepard 1996:216-217 and 1998:134.

¹⁹ Shepard 1998b:34-38, 117 and 145.

²⁰ Shepard 1998b:78.

²¹ Shepard 2002:100. Shepard was well aware of the strong prejudices about hunter-gatherers in modern society, where "progress" and "change" are celebrated and any search for references to the evolutionary past is easily dismissed as "regression", "primitivism", "atavism" or, at best, "romanticism" (Shepard 1998b:1-2). Shepard used different names -and not always the most scientifically accurate- to designate hunter-gatherers, such as "tribal societies", "hunting peoples", etc. Shepard saw no significant difference between simple/nomadic hunter-gatherers (probably the model that best represents our actual evolutionary past) and complex/sedentary hunter-gatherers (a recent late Pleistocene phenomenon). This distinction is important since some anthropogenic problems, such as slavery and warfare, probably originated among complex hunter-gatherers, and sedentary life, with storage of surpluses, was the basis for subsequent early Neolithic domestication. . On this see: Fry 2006, 2007.

symptom of cultural chauvinism.²² Modern hunter-gatherers are not living fossils, but their way of life is the most similar to the ancient way of life, which genetically we never abandoned.²³ Shepard dismisses the so-called Pleistocene overhunting hypothesis - who claims that the extinction of large animals at the end of the Pleistocene in North America was caused by the Paleoindians- since he believes that it is not only wrong, but another example of demonization of hunter-gatherers.²⁴

Shepard was a very enthusiastic proponent of the so-called "hunting hypothesis" - very influential in the 1960s and 1970s - which states that hunting has played a very important role in human evolution. According to Shepard, hunting is not cruel barbarity, but the recognition of human belonging and dependence on nature and social organization that takes into account the extra-human context. Hunting is a part of our evolutionary past, as humans have been living as hunters for about 99% of their species' history. Hunting recognizes the broader context of interrelationships between man and nature and the continuing importance of powers beyond human control.²⁵ Hunting can be a factor of ecological stability and balance between human society and the natural world in which it is situated.^{26,27} Hunting and killing in tribal societies do not imply destructive barbarism, victory over the enemy, or triumph of masculinity, but are part of a larger gift of life and of the evolutionary processes in which life feeds on life. In hunting, the crucial event is not death, but the moment of respect and affirmation of this world, as well as participation in the eternal flow of matter and energy.

In recent decades the critique of civilization has become quite common, and Shepard was one of its pioneers. According to him, the degradation of women was a consequence of agriculture and livestock and their transformation into machines that give birth to children. The low status of women culminates in civilization due to the absence of a sanctification of the place and a mythology rooted in nature.²⁸ War, state repression, many diseases, interpersonal exploitation, and other man-made problems have been fundamental features of civilization since its inception. Civilized men have been committing genocide against hunter-gatherers and ecocide against wild habitats

²² Shepard 1998c:90-93 and 131-174; 1996:136-140 and 1998b:67-77. Two of Shepard's major works on hunter-gatherers are *The Tender Carnivore and the Sacred Game* (1973) and *Coming Home to the Pleistocene* (1998).

²³ Shepard 1996:202.

²⁴ Shepard 1996:178-179 and 1998b:31-33. Today most experts believe that the anthropic factor played a significant role -together with climate change as the second factor- in the Pleistocene extinction and this does not necessarily imply defending the neo-Hobbesian demonization of hunter-gatherers or denying the important differences that exist between its ecological footprint and that of complex societies.

²⁵ Shepard 2002:202 and 209-313.

²⁶ Shepard 1999:71-76 and 2002:213.

²⁷ Shepard 1996:47-49 and 1999:69. In his early works, from the 1950s to the late 1970s, hunting was central to Shepard's theory, but not so much later. For some of the problems related to their overemphasis on hunting, see the conclusions.

²⁸ Shepard 2002:108 and 1998c:96.

and species for 10,000 years.²⁹ The pathological behavior of civilized humans -wars, genocide, urban violence, ecological destruction, etc.- is not the consequence of any moral defect or the omission of respect for the "high moral standards" of civilization, but rather the consequence of a lack of evolutionary adaptation. Our problems are manifestations of deviation from our genetic core, not consequences of any social or technical failure that can be fixed by technological adjustments or political revolutions. The civilized human has been living under tyrants, demagogues, dictators, kings and emperors for thousands of years. The despair and homelessness of civilized man today reaches its peak, as industrial societies are the most artificial and abnormal forms of social order in human history.³⁰ The industrial order is nothing more than the extension of the fundamental error committed with Neolithic domestication. War and obsessive territoriality are not consequences of our biogram but of overpopulation and other pathological circumstances due to domestication and civilization.³¹

Biosocial discontinuity theory occupies a central place in Shepard's theory. So he cannot be accused of falling into the "noble savage fallacy", which is the typical objection to any position that maintains that civilization (including domestication) can be -or *is*- the ultimate cause of all major problems, ecological or otherwise, caused by humans. As we have already said³² -it is something that must be constantly repeated- the theory of biosocial discontinuity has nothing to do with morality (goodness), it has to do with genetic adaptation. It is relatively the best explanation of the man-made problems that are the main feature of all civilizations. The two dominant interpretations - the typical model of the humanistic disciplines (man as *tabula rasa*³³, the problems are particular social circumstances) and the typical model of social Darwinism (the problem is that human nature is aggressive, selfish, and competitive) - cannot explain either human-caused problems or basic human needs. Shepard criticized the concept of "sociocultural evolution" as an erroneous analogy to (Darwinian) biological evolution and a quasi-scientific justification for the myth of historical progress.³⁴

In Shepard's work, not only is a detailed critique of civilization carried out, but also of agriculture and livestock. According to Shepard, cattle ranching has been the cause of enormous destruction of wildlife habitats, especially deforestation. Domesticated animals have been creating domesticated habitats for millennia. Cattle ranching

²⁹ Shepard 1998a:19-46, 1998b:32-33 and 1998c:26-40.

³⁰ Shepard 1998:5 and 148.

³¹ Shepard 1998b:81-85 and 1998c:40, 62, 90, 126 and 154-155. Some recent analyzes support Shepard's thesis that war is a recent phenomenon in human history (Fry 2006 and 2007), but opinions on this issue in academic circles are mixed.

³² Markus 2008 and 2009.

³³ Latin expression that comes to mean "blank page," in reference to the belief that human beings lack nature, that they are born without instincts and without any type of innate psychic tendencies or needs and that, therefore, everything that is in his mind is the result exclusively of learning and education (that is, of his personal experiences and the influences of the environment, natural and sociocultural, in which he grows up and lives) and not of genetics. *N. from t.*

³⁴ Shepard 1996:188-192.

and nomadism have notably contributed to the advance of anthropocentric philosophy in theory, and ecological destruction in practice.³⁵ Agrarian domestication was the beginning of the gradual but permanent reduction in the quality of human life: “Domestication would create a catastrophic biology of nutritional deficiencies, alternating feasts and famines, health and disease, peace and conflict. social, all inserted in the ancient rhythms of the slow collapse of ecosystems.”³⁶ For Shepard, agriculture, animal husbandry, and urban civilization are all part of a social macrodynamic aimed at an ever greater distance of humans from natural social and ecological conditions. Urban men have always idealized the surrounding countryside, but historically, the countryside and the city are two sides of the same coin. The idealization of agrarian life -as an “Arcadian” or “bucolic” garden or environment- is one of the most popular and dangerous illusions of urban man. Agrarian life -which was characterized by tedious, hard and monotonous work- can only be idealized by urban men, who live in an even more degraded and overcrowded environment.³⁷ Agriculture is the real historical cause of the war, since the increasing competition between groups was caused by population pressure and the disappearance of wild nature.³⁸ Agriculture and livestock farming had catastrophic social and ecological consequences: famines, many diseases, war, growing inequalities, degraded and polluted environments, large-scale destruction of habitats and species, genetic degeneration of domesticated species, etc. Urban societies have merely been the continuation of these trends.³⁹ For Shepard, “modern industrial societies are only part - and, in many respects, the culmination - of long-term trends towards an increasing distance of humans from their natural social and ecological conditions. Civilized man’s fanatical attempt to separate himself from other species and his pathological illusions about human omnipotence and the independence of man from nature are especially strong in industrial megacities. The modern myth of “historical progress” is a symptom of a fanatical desire of industrial man to control everything and to turn everything into a commodity for mass consumption and an object of technological manipulation.”⁴⁰

The critique of the illusion of human exceptionalism is a common theme in Shepard’s work. He criticized the attempt of civilized humanity to create a chasm between itself and other species and to forget its evolutionary past. Reason, culture, learning, and language are features of the living world as a whole, to a greater or lesser extent, and not peculiarities of a single species. Human culture is part of the surrounding ecological and organic realities and the flow of energy through ecosystems and the

³⁵ Shepard 1996:221, 1998a:3-6, 1998b:124, 154 and 155, and 2002:52-54 and 73-76.

³⁶ Shepard 1996:182 and 1998b:82-90 and 93.

³⁷ Shepard 1998b:103 and 1998c:16-20, 34-35 and 241-243.

³⁸ Shepard 1998b:86-88. Shepard was one of the first thinkers to emphasize what is now called the constituency theory: increasing population pressure within a closed geographic region (by the sea, high mountains, deserts, etc.) was the main cause of the intensification of conflicts and the origin of the state.

³⁹ Shepard 1998b:81-89 and 1998c:237-239 and 245-258.

⁴⁰ Shepard 1998a:99-105 and 1998d:146.

web of life.⁴¹ Humans are really cultural animals, but this fact does not emancipate them from nature. Culture is a system of transferring information, based on genetics and subject to biological restrictions. Without respect for such biological constraints, culture becomes the center of a fantasy world with no connection to reality.⁴² We should not overestimate the cultural difference or ignore that universal human nature is the fruit of long evolutionary processes. Other species, ecosystems, soil, air, water and other ecological aspects are not cultural constructions but the basis for human existence.⁴³ Secular humanists' attempts to replace the Christian God by Man they have been and are vain. Despite several centuries of anthropocentric illusions of secular humanism, humans are not their own doing. Social sciences and humanistic philosophy are mostly part of the anti-naturalist ideology of modern civilization with old roots in the Axial religions and ancient philosophies. This ideology advocates that humans can do whatever they want and that human adventures are free of ecological and biological constraints.⁴⁴ Shepard criticized postmodern deconstructivism as the latest humanist fad and one more example of the old anti-naturalist philosophy, far removed from nature and organic processes. The mainstream feminist movement, which tries to integrate women into this destructive society, is also a symptom of the denial of ecological and biological realities, especially in its form of moral vegetarianism.⁴⁵

Shepard was aware that science can be (mis-)used to pursue destructive ends, such as the production of weapons or ecological destruction and that it can stimulate anthropocentric arrogance towards nature⁴⁶ but he never defended relativism nor anti-scientific irrationalism. He made it clear that the search for scientific objectivity does not imply the justification of industrialism or any other type of social peculiarity. According to Shepard, modern scientific naturalism is not the cause of the despair and sense of meaninglessness that haunt modern man. Ecology, above all, plays a significant role in achieving a more balanced view of man as a small part of the natural world. Towards the end of the 1960s, Shepard believed that ecology, understood as a science, had a radical and subversive character since "it requires a type of vision that goes beyond the limits". Modern languages, with a strong idealistic and dualistic accent, hardly manage to express ecological realities. Ecology implies unity and makes it possible to consider the world from a human perspective although not from human chauvinism.⁴⁷

In Shepard's work, human ecology was always based on evolutionary (Darwinian) biology, since humans are an animal species and a product of eons of biological (Darwinian) evolution. He wrote that the prevailing indifference or even hostility among

⁴¹ Shepard 2002:XXXIV-XXXVII, 16 and 23-26

⁴² Shepard 1998c:60, 112, and 219.

⁴³ Shepard 1999:158-169.

⁴⁴ Shepard 1999:12 and 158-163

⁴⁵ Shepard 1996:153-163 and 204, 1998c:120 and 2002:107-108.

⁴⁶ Shepard 1996:117-118.

⁴⁷ Shepard 1996:112-113 and 122.

humanist intellectuals towards Darwin's theory is a consequence of the impossibility of reconciling Darwin's theory with anthropocentric humanism and with humanist illusions about human exceptionalism. Humanists do not like claims about the kinship of humans with other creatures or that man is a small part of the natural world: this is in a way an offense to "human dignity". The confusion between evolution and progress - the only way to get Darwin's theory accepted in humanist circles - has done a lot of damage, even more than the excessive emphasis placed on the existence of competition and violence in nature. But Darwinian natural selection and Darwinian evolution are not progressive processes. Evolution is not some kind of upward movement culminating in a species, but a branching bush with man at the last shoot on the recent twig of the genus *Homo*^{48, 49, 50} Evolutionary theory could have helped overcome man's distance from the natural world, but instead it was used as a justification for social inequalities and exploitation. Modern humanism never forgave Darwin for demolishing the illusions of human independence and uniqueness.⁵¹ Shepard had great sympathy for ethology, sociobiology, and other neo-Darwinian theories and their extensions into the realm of the social sciences. Morris⁵², Fox⁵³, Wilson⁵⁴ and other contemporary neo-Darwinists rightly place great importance on our evolutionary past and criticize the prejudices of anthropocentric humanism. The criticisms of contemporary humanism to sociobiology are the continuation of the old humanist anti-naturalism, a secular version of the ancient religions of agricultural civilization.⁵⁵

Unsurprisingly for an ecocentric and naturalistic thinker, the wild plays a central role in Shepard's work. It establishes a difference between *wildness* and *natural spaces*⁵⁶. *The wild* is the living world of the Earth, the complex formed by the habitats and wild species that perpetuate the biosphere, the real framework of human existence, the unit of place, the specific environment of evolutionary adaptation for certain species and genetic states. *Natural spaces* are a social construction of urban man, landscape and tourist attraction, the way urban men have of escaping from the tedious and

⁴⁸ Lowercase ("homo") in the original. By convention, in biology, the names of taxonomic genera are always written beginning with a capital letter and either italicized or underlined. *N. from t.*

⁴⁹ Shepard 1996:117 and 310, 1997:309-310, 1998c:102-103 and 1999:166. For more on the popularity of this kind of shoddy evolutionism in today's New Age and some ecological thinkers, see Sessions 1995c and Esbjorn-Hargens-Zimmerman 2009.

⁵⁰ Shepard 1996:117 and 310, 1997:309-310, 1998c:102-103 and 1999:166. For more on the popularity of this kind of shoddy evolutionism in today's New Age and some ecological thinkers, see Sessions 1995c and Esbjorn-Hargens-Zimmerman 2009.

⁵¹ Shepard 1996:117, 1997:228 and 1998:104.

⁵² The author is probably referring to Desmond Morris, a British zoologist who has written several books on the human being seen from a zoological point of view. *N. from t.*

⁵³ The author is probably referring to Munro Fox, a British zoologist. *N. from t.*

⁵⁴ The author is probably referring to Edward O. Wilson, an American entomologist and one of the fathers of sociobiology. *N. from t.*

⁵⁵ Shepard 1996:219-220, 1998d:146-147 and 1999:170-175.

⁵⁶ "*Wildness*" and "*wilderness*" respectively in the original. *N. from t.*

desperate conditions of civilized existence.⁵⁷ Organized forces try to destroy *wildness* for the benefit of *natural spaces* or to convert *wildness* into landscapes for tourist consumption.⁵⁸ *Wildness* is our natural ecological context, in which we have been living for millions of years and which cannot be erased by a few thousand years of agro-urban existence. The disappearance of *the wild* is like the amputation of a part of the body.⁵⁹ Shepard has offered a detailed critique of the concept of "landscape" as a symptom of the anthropocentric reduction of nature to a pleasing image for humans to see. In the new mechanical paradigm, wild nature is reduced to a quantitative abstraction and the landscape understood as an interesting tourist attraction, something subject to ever-changing fashions and tastes. The defenders of nature understood as landscape have never been enemies of Promethean arrogance⁶⁰ but only its helpers and the promoters of the humanization of wild nature. But even that crippled concept of nature may be a sign of a healthy human need to feel nature organic and wild.⁶¹

Shepard has written extensively about animals. For him, many of our capacities, which we emphasize when explaining that we are different from other species, actually come from our primate origin.⁶² Fundamental to Shepard's philosophy is the conviction that Other Animals played a crucial role in making us human.⁶³ Without the Other Wild Animals we cannot truly be human because wild animals are necessary for human spiritual health and maturation. There is a deep ontological need, in every human being, to coexist with wild animals; It is something necessary for the development of humanity. This perspective is incompatible with the various humanist ideologies that emphasize human exceptionalism and the supposed gulf that separates humans from other species. Industrial humans live in a domesticated environment with disabled and

⁵⁷ It is difficult to translate this fragment so that the nuances that the author (and Shepard) were trying to point out are perceived in Spanish. The concept of "wilderness" in English normally refers, in theory, to ecosystems or wild areas (precisely something similar to what Shepard, according to Markus, would refer to as "wildness"), although in practice it refers to often to protected and managed natural areas and, therefore, not totally wild (which are precisely, according to Markus, what Shepard considers exclusively "wilderness"). Shepard's way of understanding these concepts, as expressed by Markus, is therefore not exactly conventional in English-speaking countries. *N. from t.*

⁵⁸ Shepard 1996:192-195 and 1998b:131-151.

⁵⁹ Shepard 2002:266-267 and 274.

⁶⁰ In reference to the Greek myth of Prometheus. Prometheus stole the secret of fire from the gods and gave it to humans, but was cruelly punished for his insolence. Many intellectuals tend to take Prometheus as a symbol of the progressive and anthropocentric hero who sacrifices himself so that humanity advances and dominates Nature. *N. from t.*

⁶¹ Shepard 1998b:13-14, 1998c:148 and 2002:XXI-XXVIII. Mass tourism, in which wilderness is "experienced" as an "interesting" and "stimulating" environment, is a popular example of the nature-as-landscape viewpoint (Shepard 1996:104). But the parks and reserves should not be open to tourists. They are temporary refuges for threatened species until more favorable circumstances arise, perhaps after the decline in human population, when there will be more room for wilderness (Shepard 1999:179).

⁶² Shepard wrote extensively about it in *Tender Carnivore and the Sacred Game* (1973) and, although some of his analyzes are out of date today, the main line of his reasoning remains valid.

⁶³ Shepard wrote about it in all of her works, but most extensively in *Thinking Animals* (1978) and *The Others* (1996).

controlled animals, but the need to coexist with the wild animal Other remains present nonetheless. Misconception of animals as machines or adorable babies is also a product of humanist ideology, of the refusal to accept independence from Others.⁶⁴ Humans are not unfinished animals and we do not mature from animality, but through it.⁶⁵ The expansion of agriculture and livestock has been generating the progressive disappearance of the Other animal in culture and in the way of thinking. The metaphors of the living for hunter-gatherers are the other species, for farmers the mother, for ranchers the father and for industrial humans the machine.⁶⁶

Shepard had a very negative opinion of pets. They are degenerate, disabled monsters, as their wild genome changed under human control, something that has never happened before in billions of years of evolution. They are miserable caricatures and cannot be adequate substitutes for the wild species. Just like civilized humans, domesticated animals lost their connection to their natural habitat and the possibility of normal maturation. Animals isolated from their natural context are ecologically dead. Domestic animals have many defects compared to their wild cousins: a smaller brain, the deviation of many of the organs, a less acute sense of smell, sight and hearing, longer maturation, etc.⁶⁷ Domestic animals are slaves to humans who divert our attention from wild species. Zoos and pets can give satisfaction to civilized humans because of the poverty of their lives. Zoos, like prisons, become havens for defective and disabled animals whose habitats have been devastated.⁶⁸ Humans do not want to admit that domestic animals are their slaves or degenerates, as they remind them of the old wild life. Humans are even more depraved than their pets since they have not been genetically altered through domestication. The extremes in the attitudes of modern humans towards domestic animals - from deep love to cruel mistreatment - are symptoms of the strong disappointment we suffer because they are unable to reconnect with our wild genetic past. Pets are organic slaves and cannot satisfy the compelling human need for connection with wild nature. But a love of pets signals an intuitive understanding that animals are necessary for human development and maturation and as a defense against despair and madness.[1082]

Criticism of animal liberation and (moral) vegetarianism appears frequently in Shepard's work. According to him, animalism -whose most famous representatives are P. Singer⁶⁹ and T. Regan⁷⁰- has a certain meaning if it is applied to domestic animals and wild animals that are subjected to control by humans. But it is completely absurd if

⁶⁴ Shepard 1996:104, 1998c:40-41, 84-85 and 231, 1998d:35-36 and 233 and 1997:4 and 278.

⁶⁵ Shepard 1997:112 and 1998d:3 and 40.

⁶⁶ Shepard 1996:9.

⁶⁷ Shepard 1996:61-62, 1998a:113 and 1998c:9-16 and 264-266. Shepard wrote extensively about domestic animals in *The Others: How Animals Made Us Human* (1996), her last book.

⁶⁸ Shepard 1997:231, 1998c:265-266 and 1999:195.

⁶⁹ Probably Peter Singer, Australian utilitarian philosopher, famous for his work *Animal Liberation*. T.N.

⁷⁰ Probably Thomas Regan, American philosopher, specialized in animal rights theory. N. from t.

you try to forcefully apply it to wild animals in their natural habitats. Wild animals do not have "rights" but they do have something much more important: a genetic heritage and an evolutionary past, both of which must be respected. The concept of "law" is a product of modern liberalism and is meaningless outside of industrial society. In nature there is a lot of cooperation and altruism, but not friendship. Wild animals do not need our "friendship" but rather protection from those who want to destroy their habitats in the name of "technological progress", and from those who want to extend humanist ethics in the name of "moral progress" to include wild animals as well. It is true that animalism is a healthy symptom of the human need for the Other animal, but expressed in a distorted way, without connection to ecology and reducing nature to a few individual beings, in the image and likeness of humans.⁷¹⁷² Humans must, like any other species, modify and intervene in certain parts of the natural world but must not try to impose their social and ethical values on that world.⁷³

Shepard pointed out that animal advocates often preach moral vegetarianism with great fervor, believing that the acts of dying and killing are evil and unnatural. But this is absurd, since life feeds on life - dying and killing is something that is an inseparable part of the foundations of life. The condemnation of hunting and meat eating is a symptom of humanistic ideology, neurotic oppression, hysterical fear of death, and the inability to accept the acts of dying and killing as a normal part of the natural world. Moral vegetarianism had its origins in India, in a degenerate and overpopulated environment, but it has found fertile soil in all civilized societies.⁷⁴ Shepard also criticized the ethical philosophy of Albert Schweitzer⁷⁵, a well-respected name in environmental circles, as an example of anti-naturalist ideology. Schweitzer's famous dictum "reverence for life" (*Erfurcht für Leben*) only appears to have a naturalistic and proto-ecological orientation, but in reality it is a sign of the old humanist desire to attain eternal life. and to defeat death. Schweitzer was an atomist, he did not understand ecological realities and he was a man who considered nature a bloody battlefield. For him, man had the "mission" to bring "order" and "meaning" to cruel and chaotic nature. Schweitzer's ethic is a product of several thousand years of agricultural domestication

⁷¹ Shepard 1996:63 and 197 and 1997:304-320. Shepard has criticized the foundations of animal rights stance, most often linked to Tom Regan, but Peter Singer's rejection of pain is also, according to Shepard, unnatural and a symptom of humanist arrogance. Regan and Singer both advocate moral vegetarianism for which Shepard has nothing but contempt.

⁷² Shepard 1996:63 and 197 and 1997:304-320. Shepard has criticized the foundations of animal rights stance, most often linked to Tom Regan, but Peter Singer's rejection of pain is also, according to Shepard, unnatural and a symptom of humanist arrogance. Regan and Singer both advocate moral vegetarianism for which Shepard has nothing but contempt.

⁷³ Shepard 2002:208.

⁷⁴ Shepard 1996:188, 1998b:164, 1998c:152, 1998d:188, and 1999:157.

⁷⁵ Albert Schweitzer, early 20th-century French-German physician, philosopher, theologian, and musician. His strongest conviction was that respect for life is the highest principle. *N. from t.*

and Christian humanism with its black and white view of nature and its demonization of predation.⁷⁶

Shepard sharply criticized traditional (institutional) or axial religions, such as Christianity, Islam, Buddhism, Hinduism, etc., but especially Christianity for being the dominant Western religion.⁷⁷ The hatred of wild nature has been and is deeply embedded in Christianity, the most urban of all religions. Christianity took part in the destruction of the natural world, which was understood as a temporary stage and a valley of tears or, in the best of cases, as the background of the stage in which the human drama was represented.⁷⁸ The central religious and philosophical dogma of the West is the attempt at a radical separation between the spiritual and natural worlds. The New Testament is perhaps the most anti-organic and anti-naturalistic example of human thought of all time.⁷⁹ But, according to Shepard, there is no significant difference between Western religions (Christianity, Islam and Judaism) and Eastern ones (especially those of India). All world religions are anthropocentric and afterlife oriented, containing a deep hatred or indifference towards wild nature. They can do little to prevent it, since they are a symptom of fundamental alienation from our natural evolutionary context and a consequence of the abandonment of hunter-gatherer life. His orientation towards the supernatural and his individualistic salvationism are consequences of the increasing social and ecological disintegration, meaningless life and abnormal social conditions of civilized humans.⁸⁰ Jainism and Buddhism are not the manifestation of a proto-ecologist love of nature but of a hatred of organic processes and a desire to escape from the intolerable, socially repressive and ecologically devastated agricultural world of India.⁸¹ Sacrifice - a typical characteristic of all livestock and agricultural religions - is a symptom of the substitution of the old conviction, typical of hunter-gatherers,

⁷⁶ Shepard 1999:56-66 and 2002:190-205.

⁷⁷ This criticism has become more common in recent years, with many scholars emphasizing abnormal sociohistorical circumstances as a precondition for the rise of axial religions (DiZerega 2000, Lerro 2000 and 2005, and Harvey 2006).

⁷⁸ Shepard 2002:104 and 220-226. Shepard's first critique of Christianity was published in 1967 - the same year that Lynn White's famous article "The Historical Roots of Our Ecological Crisis" was published - but his analysis, based on a much broader historical and ecological perspective, it is superior to White's, though much less famous. Shepard's critique was materialist - not idealistic like White's - since for Shepard religious and philosophical ideas are much more symptoms and consequences of the material conditions of human life than their causes. A recent historiographical reassessment of the history of Asia - China as the center of the world economy until the end of the 18th century - has been very damaging to White's theses (especially his association between Christianity and technology), but not to Shepard's. [There is a Spanish translation of White's article: "The historical roots of our ecological crisis", *Revista de Occidente*, n° 143-144, 1975. *N of t.*].

⁷⁹ Shepard 1998a:70-80.

⁸⁰ Shepard 1997:317 and 325 and 1998d:127 and 210. Shepard did not comment on recent attempts to "green paint" Axial religions and the emergence of so-called eco-Christianity, eco-Islam, eco-Buddhism, etc. ., but he could hardly have felt any sympathy for them. This opportunistic quasi-ecology is a futile attempt to "green paint" something that is profoundly anti-naturalistic and anti-organic. He would probably have had more sympathy for neo-paganism (primitivist).

⁸¹ Shepard 1996:198 and 1997:312.

that humans are guests who receive gifts, by negotiating with supernatural beings, full of envy. and greed. The liturgy of sacrifice reveals a despiritualized natural world, full of scarcity and violence, which becomes a resource for human bargaining. Shamanism is part of this change, since the shaman is not the personification of ecological consciousness but an opportunist and usurper who misuses the fear felt by the livestock and farming population, caused by the growing scarcity and the increasingly frequent wars. Shamanism was creating the despiritualization of habitats and wild species for the benefit of an abstract and celestial world. Shamanism probably constitutes the first case of patriarchal domination, since shamans were and always are men.⁸²

A significant and extensive critique of the concept of "history" is made in Shepard's work. Shepard defended that the central theme of that western construction that is history is the "rejection of the habitat. [The story] formulates the experience outside of nature and tends to reduce the place to a mere emplacement... The story is the enemy of complicity with nature, having arisen in a tragic perspective of man against nature, or of nature like something neutral. Using nature as a political parable, he sees all events ideologically."⁸³ The Jewish and Greek demythologizers destroyed the myth of the eternal return which was the beginning of the later model of nature as alienation. The story rejects the "ambiguities of overlapping identity, of space and time, and creates its own dilemmas of discontent and estrangement from the Others, from non-human life, from primitive ancestors and tribal peoples." It creates a continuous neurosis and a life of quiet despair subjected to the oppression of illusions and falsehoods.⁸⁴ History is the "declaration of independence from the deep past and its peoples, from life and death, of the natural state of being, which is outside its own domain. History means the desacralization of the past, of the place and of nature, it is an ideological construction of civilized man, which contributes enormously to collective pathology and madness."⁸⁵ The story denies the ancient mythological interpretation of the world "which sees time as a continuous return and space as something sacred, where all life is indigenous." History creates a state of remoteness from other species, from human ancestors, and from one's own (local) territory. Historical consciousness has gradually "uprooted animal metaphors, organic continuities and, above all, the perception of non-human spirits of the earth." Historical thought cannot answer the question of how to become native in a place, because it is "the great denativizing process, the great uprooting. Historical time focuses on change, on novelty, and escapes the renewed stability and continuity of the great natural cycles that anchor us to place and to life on earth in general."⁸⁶ History is not a neutral record of past events, but "an active psychological force that separates humanity from the rest of nature, due to its indifference to deep connections with the past." History is also a declaration of

⁸² Shepard 1998b:91-92 and 114-116 and 1999:94-95.

⁸³ Shepard 1998a:46-47 and 62.

⁸⁴ Shepard 1996:167-171.

⁸⁵ Shepard 1996:170-171.

⁸⁶ Shepard 1998b:9-13.

independence from nature, which remains important only as an object of scientific and technological manipulation. By rejecting the importance of myth, history distorts the basic human sensory and intellectual processes that have always been a vital part of our humanity.⁸⁷ History is the “ideological framework that excludes (Western) man from the restrictions of seasons, places, nature and their religious implications. History is the desecration of the world based on writing, prophetic interference and opposition to the natural order. It is not precisely what it seems - the evidence of continuity with the past. On the contrary, it is a convulsive rupture with the true profound past, a divine intercession, full of coincidences and radical novelties.”⁸⁸

Shepard was ambiguous when it comes to the human future. In one of his first works, Shepard defended the creation of technocinegetic societies with complex technology, synthetic food, bacteria genetically designed to process food, and other techno-miracles. In such societies, around 8 billion people would live in megacities separated from each other by wild spaces.⁸⁹ But later, he no longer wrote about techno-hunting societies or any other future utopia. Instead, he called for the restoration of at least some aspects of ancient life within today’s industrial order. He knew that we cannot recover hunter-gatherer life or animistic consciousness, but the recovery of at least some aspects of ancient life might be possible. Humans are an animal species that belongs to the Pleistocene and this is our hope for a better future.⁹⁰ We never abandoned our evolutionary heritage and it would be enough to stop to realize it and develop an ecological citizenship that restores some principles, metaphysical notions and basic spiritual features of Pleistocene life. This does not have to be a rational decision, since humans are unconscious builders of culture.⁹¹ There are many difficulties and problems but there will be hope for human beings as long as the green Earth and wild nature remain with us.⁹²

***II. The continuing topicality of Shepard’s thought and some of its problems.

As I have already said, part of the great strength of Shepard’s philosophy is the relationship it establishes between ecology and evolutionary biology or the fact of basing human ecology on Darwinian biology. Many philosophers, theologians, sociologists, and other thinkers have “discovered” ecology over the last 30-40 years, but for them ecology has been (and mostly still is) separate from biology. Most of these thinkers received a humanist education and are not comfortable with Darwinism, especially when they are unable to separate Darwin’s original ideas from so-called Social Darwinism. Without biology, the “greening” of social thoughts is quite superficial. Very

⁸⁷ Shepard 1998b:14-16.

⁸⁸ Shepard 1999:174. Professional historians would be very perplexed to hear what their profession and work really mean. I am a professional historian and am well aware of how convincing and devastating Shepard’s critique of historical thought is.

⁸⁹ Shepard 1996:142-143, 1998c:277-278. This techno-optimism and this almost absurd utopianism were quite atypical for Shepard and constitute an exception in his work.

⁹⁰ Shepard 1996:15 and 107.

⁹¹ Shepard 1998b:88-89, 107, 154-155, 164, 170, and 173. These claims are obscure and confusing, and Shepard was probably aware of this. But in his day, he believed it was the best we could do.

⁹² Shepard 1996:209.

often, “Darwinism” has negative connotations for modern environmental thought or is simply ignored by it. Popular versions of Darwinism often emphasize competition and give a dark view of nature by presenting it as a bloody battlefield⁹³ or confuse evolution and progress. But Shepard knew well how to recognize that the so-called social Darwinism is a perversion or a misapplication of Darwin’s theory in order to justify the various inequalities of human societies. The “essence” of Darwinian evolution is genetic adaptation to changes in the local environment and cannot be used to justify some important aspects of complex societies that are the product of social macrodynamics in the recent human past. Darwin’s theory has a normative implication - all living things should live in their natural environment - and for humans this means that we should live as hunter-gatherers. Civilizations are recent phenomena and cannot be the product of long-term processes of Darwinian evolution. Contemporary Darwinian thinkers - evolutionary psychologists, sociobiologists, bioanthropologists and others - accept the existence of an evolutionarily shaped human nature, which means nothing more than the genetic adaptation to living in small nomadic groups in a wild environment.⁹⁴ Shepard made clear the distinction between evolution and progress and, from the early 1970s, defended the theory of biosocial discontinuity accordingly. By integrating three crucial perspectives on human behavior - the ecological, the evolutionary and the sociohistorical - he was one of the first integral thinkers.

A detailed and well-argued critique of civilization and domestication appears in Shepard’s work. This criticism was consistent - unlike many others, Shepard did not only partially reject the myth of historical progress - and was based on the theory of biosocial discontinuity. Thus he was warned against the usual objection - the fallacy of the noble savage. Critiques of civilization, which ignore evolutionary biology and biosocial discontinuity theory, easily fall prey to romanticism and the idealization of hunter-gatherers.⁹⁵ But, there is no need to moralize or idealize the old way of life. Optimum quality of life and the absence of anthropic problems are consequences of

⁹³ Or else “Darwinism” is often seen as simply embedded in some “modern scientific paradigm” that involves physical mechanism and needs to be superseded by some new ecological philosophy of nature (e.g. Capra 1983 and 1998, Goldsmith 1998 and Rowe 2003 and 2006). But, as Shepard already pointed out, it doesn’t necessarily have to be that way. The “conventional” interpretation of neo-Darwinism - understood as genetic adaptation to a local environment - is more than enough to understand our thesis if we accept the theory of biosocial discontinuity. There is no need to be hostile towards modern science that contains anti-anthropocentric elements.

⁹⁴ Of course, there are multiple opinions and divergences about what exactly human nature consists of. Many social scientists remain stubborn in the traditional faith in human exceptionalism and in the crucial importance of cultural adaptation (the standard model of the social sciences). And some Darwinists try to defend the old human exceptionalism and faith in “historical progress,” but this is a consequence of their personal (liberal) moral biases, not of their scientific (Darwinian) stance. For more information about current disputes over the social implications of Darwin’s theory and biosocial discontinuity theory, see: Markus 2008 and 2009.

⁹⁵ That mistake is typical of many anarcho-primitivists, including John Zerzan. As a naturalist, Shepard never tried to mix any modern humanist ideology, such as anarchism, with the Darwinian critique of civilization.

genetic adaptation, not moral perfection. These two criteria - that is, fundamental needs (positive approach) and anthropic problems (negative approach) - are crucial for any substantive and scientific critique of social macrodynamics and its harmful consequences. Shepard clearly differentiated the wild (or the wild natural world), on the one hand, from domestication/civilization, on the other. In recent years, there have been multiple disputes about whether or not wilderness is a mere concept of cultural/social origin.⁹⁶ Many futile disputes would have been avoided if Shepard's distinction between wilderness and natural spaces⁹⁷ (not necessarily with these same words) would have been adopted. But this would imply a radical critique not only of industrial society - something too radical for many ecological thinkers - but of civilization as a whole. Even for many deep ecologists, with their often idealized emphasis on "anthropocentrism"

(that is, in anthropocentric ideas and worldviews), Shepard's thinking seems too radical.⁹⁸ His critique of animalism and moral vegetarianism is very convincing but is overlooked by recent academic literature.⁹⁹

Three "revolutions" - or paradigm shifts - in contemporary science come together in Shepard: the historical/anthropological (a significantly different interpretation of recent human history, civilization, and hunter-gatherers), the evolutionary/Darwinian (giving importance to the deep evolutionary past of humans) and ecological (considering man as part of nature and recognizing the importance of the natural world, not only for physical survival, but also for human health and well-being). Shepard was truly an all-encompassing thinker as he brought together three crucial aspects of human life and three crucial perspectives for understanding human behavior: the ecological (our belonging to a larger natural world), the sociohistorical (social macrodynamics), and the biological. (our evolutionary past or our genetic inheritance). This is a valid scientific perspective, not like the confusing and obscure New Age considerations about an "inner dimension", a "spirituality", a "subjective life", etc. These terms make sense as expressions of human genetic inheritance or the human biogram, that is, our genetic adaptation to a particular, evolutionarily shaped social and ecological environment.¹⁰⁰ Shepard's perspective was totally naturalistic and this is not, in my opinion, a flaw, but rather his greatest strength. He showed very convincingly that the naturalistic perspective and scientific materialism do not lead to nihilism or moral relativism. Quite the contrary, the naturalistic perspective - not necessarily always with the same con-

⁹⁶ Cronon 1995, Callicott-Nelson 1998, and Nelson-Callicott 2008.

⁹⁷ "Wildness" and "wilderness" in the original. See footnotes 8 and 57. *N. from t.*

⁹⁸ Some scholars initially follow Shepard in emphasizing biosocial discontinuity but then almost completely forget about it (for example, Oelschlaeger 1991, Sessions 1995b, and Bender 2003), perhaps because of a partial reading of Shepard's work. Some critics of Shepard's work completely ignore biosocial discontinuity theory and accuse Shepard of falling into the noble savage fallacy (Esbj m-Hargens-Zimmerman 2009). But, as we have seen, they are wrong.

⁹⁹ For example, some contemporary environmental thinkers sporadically mention Shepard but ignore his critique of animalism and vegetarianism, even though such themes are central to his books (Evans 2005, Kheel 2008). Most just ignore him completely.

¹⁰⁰ For a more detailed view of what a true integral theory should entail, see: Markus 2009.

clusions as Shepard, of course- is the only way to avoid subjectivism and metaphysical obscurantism. Science - and this refers mainly to evolutionary biology - can tell us what a good and meaningful life consists of or how we should live - if science can't, then who?¹⁰¹ And the defense Neither does scientific materialism imply the justification of modern society, industrialism or capitalism, since Shepard knew that the bases of scientific objectivity are part of the cognitive structure of the human brain -the product of hundreds of thousands of years of evolution. biological - and are not the product of this or that sociohistorical peculiarity. It integrated the best parts of modern science and its ecocentric (not anthropocentric) tradition. Therefore, the defense of scientific rationality and objectivity does not mean the defense of industrial civilization or of civilization as such. This conclusion is especially relevant to your fellow Americans, among whom fundamentalist religion and attacks on scientific naturalism have been and continue to be very strong. Shepard knew that we can find a good and meaningful life in this world, but not in industrial society or any of the other unnatural social systems, but in the wild natural world to which our genome has adapted and continues to adapt. He had no patience for humanist talk about the "social construction" of meanings that must be imposed on a meaningless world.

Shepard's theory, based on the theory of biosocial discontinuity, is a successful alternative to two opposite but equally partial perspectives: the typical model of the social sciences (the human is a *blank slate*, only matters sociohistorical contingencies, the only important thing is social macrodynamics) and the typical model of social Darwinism¹⁰² (only human nature matters, biology is the only important thing). For Shepard, human behavior is changing -and a lot- with "ideas" and with the rest of the idealistic baggage, but not human nature. Shepard was not a biological determinist, as he recognized the great importance of social macrodynamics (with mainly harmful consequences) and the existence of different forms of human behavior in different societies. Shepard avoided the false dichotomies of cultural and biological determinism, typical of the two typical models, but also the dark metaphysics and the idealistic/subjectivist spirituality typical of much of the New Age (especially the Californian current) and of the so-called integral thought. . Shepard knew that the recognition of certain elementary facts about humans, understood as an animal species and part of nature, is not enough. Those are true but superficial statements. Our naturalness

¹⁰¹ The hostility towards science in radical environmental circles is a consequence of reducing it either to technology or to physics and the mechanistic paradigm, but neo-Darwinism does not fit into either category. Unlike physics (or astronomy, geology, etc.), evolutionary biology is very relevant to living things, including humans. Some scholars, such as Eugene Halton, criticize civilization based on the theory of biosocial discontinuity, invoking Shepard's theory, but reject Darwinism, which, ironically, opened the door to the creation of said theory (Halton 2005, 2007).

¹⁰² That is, *real* social Darwinism or social Darwinist theory - like contemporary sociobiology and evolutionary psychology - not so-called "social Darwinism" (or, more correctly, social Lamarckism) in the popular sense of the expression.

and animality have a deeper meaning, that is, genetic adaptation to specific social and ecological conditions and the existence of a universal human biogram.

In the academic literature, Shepard is regarded primarily as a follower of the "school" of deep ecology.¹⁰³ This is true in the sense that the critique of anthropocentrism and the "cult" of the wild are typical of deep ecology. But there are also significant differences, as Shepard was much more consistent in his perspective than most deep ecologists are. For example, Arne Naess, creator of the concept of "deep ecology", knew nothing about the theory of biosocial discontinuity, and the Darwinian perspective and the critique of civilization were quite far from him.¹⁰⁴ The lack of an evolutionary (Darwinian) perspective is a major flaw in most of the deep ecology literature. In deep ecology the idealistic point of view - for example, G. Sessions¹⁰⁵, B. Devall¹⁰⁶, A. Drengson¹⁰⁷ and many others - is often the more significant. But, as we have seen, for Shepard, ideas, consciousness and worldviews are much more symptoms and consequences than causes of anthropic, ecological or other problems. Most proponents of deep ecology have accepted Naess's fundamental ideas - self-realization and identification - as central to this type of ecological philosophy. But Naess's notion of such ideas was very confused and took on the appearance of some kind of obscure psychologizing metaphysics.^[106 107]¹⁰⁸ Views from Shepard's work, self-actualization (i.e., the satisfaction of fundamental needs) and identification (that is, the connection with a local social and ecological context, or with the environment of evolutionary adaptation), acquire the sense that the Darwinian perspective gives them. But for Naess and most deep ecologists, that Darwinian perspective was *terra incognita*.

Certainly there are some problems and confusions in Shepard's work. He unnecessarily burdened his theory with the hunting hypothesis and was never able to totally reject it. The terms he used to describe hunter-gatherers - "hunting" or "hunting" societies - are also signs of the primacy that hunting had in his thinking. In the 1960s and 1970s, this hypothesis was very popular, but not so much later. Today, most scholars believe that hunting did not play a crucial role in human evolution and that it only gained signifi-

¹⁰³ Oelschlaeger 1991, Sessions 1995b and 1995c, Taylor 2000 and 2009, Luton 2001, Kidner 2001, Fisher 2002, Hibbard 2003, Bender 2003 and 2007, and Esbj m-Hargens-Zimmerman 2009.

¹⁰⁴ In fact, there is a big difference between Naess (whose academic foundations are Spinoza, Gandhi, and continental European humanist philosophy) and Shepard (who was a biologist and field naturalist). The basis of Shepard's ecological philosophy was epistemologically better than that of Naess, since ecology is naturally connected with biology and naturalistic thought, but not with the traditional philosophy of the European continent or India. With modern natural science, especially evolutionary biology, we need not go looking for any proto-ecological thought in ancient philosophy. George Sessions criticizes postmodern deconstructivists for denying human biology, but never says why our evolutionary past is important or how his admiration for Shepard can be reconciled with his (Sessions') idealistic view of consciousness shift (Sessions 2006).

¹⁰⁵ Probably George Sessions, American philosopher, defender of deep ecology. *N. from t.*

¹⁰⁶ Probably Bill Devall, American sociologist and philosopher, defender of deep ecology. *N. from t.*

¹⁰⁷ Probably Allan Drengson, North American philosopher, defender of deep ecology. *N. of the t.*

¹⁰⁸ In my book (Markus 2006) I explained in detail why Naess was "guilty" of "digressing" from deep ecology into abstract psychology and quasi-metaphysical thought.

cant importance with the appearance of *Homo*¹⁰⁹ *sapiens sapiens* anatomically modern, too late to form part of our genetic heritage.¹¹⁰ Certainly hunting with firearms, by members of the industrial middle class - to which Shepard himself belonged - and in national parks (a form of megazoans) cannot be in touch with our old way of life.¹¹¹ Unlike biosocial discontinuity theory, however, the hunting hypothesis was never central to Shepard's fundamental position. There is also some discrepancy between the materialist and idealist positions in Shepard's work. Biosocial discontinuity theory is basically a materialist position, but Shepard often emphasized the great importance of worldviews and ideas while offering some practical suggestions. He advocated some form of cross-cultural utopianism or an attempt to recapture certain vital aspects of hunter-gatherer life within industrial society (or to create a way of life that better fits our genetic heritage) but never explained how that could be achieved. His suggestions ranged from impractical utopianism to ethereal idealism. Community, one's own territory, equality, and a clean and wild environment were an integral part of hunter-gatherer life and probably could not exist in a fundamentally different social order. Perhaps Shepard would think differently today, when demographic and societal collapse are a far greater possibility than it was in his lifetime. The current mega-crisis of industrial civilization as a whole would not surprise him, but he would see it as the logical consequence of *excess*, yet another symptom of the culmination of ten thousand years of crisis.

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¹⁰⁹ See footnote 49. *N. from t.*

¹¹⁰ Some scholars even believe that our ancestors were much more prey than hunters and that being prey has played a crucial role in human evolution (Hart-Sussman 2008). This is probably the opposite extreme, but we'll never know for sure due to lack of evidence.

¹¹¹ Shepard mentioned and rejected, only sporadically, the objection that hunting is quite correct when carried out in hunter-gatherer societies, but not when practiced as a sport by the middle class (Shepard, 1996:179). But this is a substantial objection that deserves a more detailed analysis. Personally, I am not a hunter and cannot find any satisfaction in hunting, not because of moral vegetarianism, "sanctity of life", condemnation of death or any other humanistic/idealistic creation, but because sport hunting has more of affirmation of an unnatural social order than of its transcendence. And, certainly, it is not a behavior that can be carried out by many humans in today's world.

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Presentation of “THE WILD, THE CYBORGS AND OUR ECOLOGICAL FUTURE”

The Norwegian philosopher Arne Naess is a key figure in what is known as *deep ecology*, he was the one who coined that term in his 1973 article, “The movements of superficial ecology and deep ecology: a summary”. Initially, the dissemination of Naess’s ideas was limited to academic environments, but in the late 1970s and early 1980s, deep ecology landed in the United States and began to spread more widely. beyond academic circles. The author of the text that follows this presentation, the Californian philosopher George Sessions, played a very important role in this dissemination. Together with Naess, Sessions was responsible for writing the principles of deep ecology (1984) and for editing two of the most important monographs on deep ecology (the first in 1985, *Deep Ecology*—along with Bill Devall- and the second in 1995, *Deep Ecology for the 21st Century*).

In “Wildness, Cyborgs, and Our Ecological Future,” George Sessions responds to the criticisms launched from postmodernism, social ecology, and feminism against deep ecology and, at the same time, reviews the situation of the deep ecology movement in the context of global ecological crisis and reaffirms its basic ideas.

The typical philosophical style in which the text is written, constantly citing and referring to other authors, makes it quite heavy and cumbersome to read. But, despite this, the text deals with many issues of interest. This is the case, for example, of the debates about the existence of a wild Nature.

Sessions provides examples that clearly illustrate the incompatibility between the defense of social justice and the ecocentric defense of Nature. But, in this text, the reader will not only be able to appreciate the errors and miseries derived from social ecology, feminism or postmodernism, but will also be able to see the many and serious burdens that deep ecology drags.

THE WILD, CYBORGS, AND OUR ECOLOGICAL FUTURE: Reexamining the Deep Ecology Movement.

By George Sessions[i]

Public awareness of global warming, as the most alarming and visible aspect of the global ecological crisis, has increased dramatically in recent years. This most recent phase of ecological consciousness has been brought about by the scientific community (particularly the Intergovernmental Panel on Climate Change), religious leaders around the world, Jared Diamond's bestselling *Collapse*, environmental journalists like Bill Moyers, Bill McKibben and Mark Hertsgaard, and now Al Gore's documentary on global warming. As Rajendra Pachauri, director of the Intergovernmental Panel, said last year, "we are endangering the ability of the human species to survive." But let's not just obsess over global warming, Diamond lists twelve problems (including - in addition to global warming - overpopulation, loss of biodiversity and loss of wildlife habitats leading to a critical decline in ecosystem services), each of which, according to him, would be capable of causing the global collapse of civilization.¹ British scientist James Lovelock recently warned that "no more natural habitats should be destroyed anywhere [...] ecosystems Earth's natural resources underpin the planet's climate and chemistry.

In his critique of sustainable development, environmental historian Donald Worster notes that:

In the 1960s and 1970s, the goal [of the most thoughtful leaders] of environmentalism (...) was to save the living world around us, millions of species of plants and animals, including humans, from destruction by our technology, our population and our appetites. The only way to do that (...) was to embrace the radical idea that there must be limits to growth in three fields (...) limits to population, limits to technology, and limits to appetite and greed. Underlying this view was a growing concern that the secular, materialistic, progressive philosophy on which modern life rests, on which, in fact, Western civilization has rested for the last three hundred years, is profoundly wrong. and, ultimately, it is destructive to us and to the entire fabric of life on the planet.

This necessary combination of population, consumption, and technology with limits to growth was formulated in 1971 by Stanford biologist Paul Ehrlich and UC Berkeley physicist John Holdren in their famous $I=PAT$ equation: the ecological impact is the product of the size of the population multiplied by the level of consumption and by the

¹ Translation by BR of "Wildness, Cyborgs, and Our Ecological Future: Reassessing the Deep Ecology Movement," originally published in *The Trumpeter*. Journal of Ecosophy, vol. 22, no. 2, pages 121-182 (2006). *Translator's note*.

nature of the technology used.² This equation provides the basis for scientific consensus regarding the ecological state of the world.

But what place do contemporary ecophilosophers, environmental ethicists, and environmental historians—social ecologists, ecofeminists, and Callicott with his Leopoldian ethic³—have in this new ecological renaissance? Or is it that, in reality, they have been counterproductive for said rebirth? Generally, these contemporary ecophilosophers and environmental ethicists have paid very little attention to the implications of the I=PAT equation and to the dire warnings from scientists around the world about the global ecological crisis. Furthermore, there has been a recent coordinated effort by Deweyan neo-pragmatists⁴ (Brian Norton, Bob Taylor, Ben Minteer, Andrew Light, Paul Thompson, and others) to appropriate the field of ecophilosophy through the pages of *Environmental Ethics* and other magazines, even though Bob Taylor admits that Dewey was anthropocentric and promoted the exploitation of Nature.⁵ At the same time, William Cronon, Carolyn Merchant, and a new circle of anthropocentric left-wing postmodern deconstructivists have wrested the field of environmental history from Donald Worster, Roderick Nash, and other environmental history founders, who were primarily concerned with philosophical development of environmentalism and the worsening of the ecological crisis. Michael Zimmerman has drawn parallels between neo-pragmatists and postmodern theorists, with their fundamental political concern with such human issues as social justice, democratic institutions, and fear of totalitarianism and fascism.⁶ But why call this ecophilosophy or environmental ethics? Concern about the global ecological crisis and the ecophilosophical critiques and theorizing inspired by

² Original title: *The Vanishing face of Gaia*.

³ In reference to Aldo Leopold (1887-1948), an American ecologist and conservationist. *N. from trans.*

⁴ Referring to John Dewey (1859-1952), an American psychologist and pedagogue, and one of the leading pragmatic philosophers. Pragmatism is a philosophical current developed in the United States from the end of the 19th century focused on the practical consequences of ideas. Pragmatism maintains that the meaning of a concept lies in its practical consequences and is firmly opposed to the notion of intrinsic value (whether applied to nature or to anything else) and the existence of a human nature. For pragmatists there is a continuity between nature and humans and, therefore, humans should not control or dominate nature but manage it or, according to Dewey, act like a gardener who ingeniously uses some parts of nature to manage others. At the end of the 1990s, a series of ecophilosophers began to vindicate pragmatic ideas, arguing that environmental ethics were too theoretical and vitiated by intellectualism. What interests these neopragmatic or environmental pragmatic philosophers is that environmental ethics influence political decision-making and the development of concrete social practices that promote ecological and social justice. *N. of the trad.*

⁵ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁶ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

it have been forgotten or deliberately discouraged. The most important philosophical/ecological controversies taking place today, such as critiques of anthropocentric and economic worldviews and of the cybernetic/technological substitution of the biosphere, have been sidelined. It is as if these theorists have gone back in time, to a moment before there was widespread awareness of the global ecological crisis.

David Nicholson-Lord, writing recently about the disappearance of the overpopulation issue from the public consciousness and from the political agendas of environmental organizations, wonders if we shouldn't be concerned that the human population has doubled three billion in 1960 to six and a half billion today and that, according to forecasts, it will reach nine to ten billion in 2050. Points out that analyses of the ecological footprint show that, at present, Humans have exceeded the carrying capacity of the Earth by 40 percent and that this number could grow to 130 percent by 2050. The influence of Julian Simon's "unlimited growth" perspective on both the right and the left Politics has contributed greatly to this lack of awareness, and the public, and perhaps a new generation of academics, have been captured by the anti-ecological propaganda of the right wing. to the point of not taking into account the reality of the global ecological crisis. Furthermore, Nicholson-Lord also notes the widespread return to anthropocentrism in recent decades ("human society turns in on itself and loses touch with nature") as a major cause of this lack of awareness.⁷ This runs parallel to the ecologically conservative anthropocentric backlash of neopragmatists and postmodernists in the academic fields mentioned above.

At the same time, the deep ecology movement, which since the 1960s and 1970s has been primarily concerned with the full dimensions of the global ecological crisis and the abandonment of anthropocentrism, has been ruthlessly attacked by both the right and the right. the political left. Fred Buell's extraordinary and scholarly analysis of environmentalism, *From Apocalypse to Way of Life*, rigorously documents the vast campaign of anti-environmental misinformation waged by the Republican right that began with Ronald Reagan and Julian Simon, and which pointed to deep ecology as the main culprit.⁸ One textbook author noted that "sometimes it seems as if Deep Ecology acts as a lightning rod for criticism and attacks on environmentalism. Because Deep Ecology questions the dominant worldview, we should not be surprised to find a significant critical reaction."⁹ The attacks continued into the 1980s, from the academic left with Murray Bookchin and his social ecology, ecofeminists, and, more recently, neo-pragmatic and postmodern theorists. Some of these attacks are part of legitimate academic give-and-take, but many others have been the result of unusually

⁷ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁸ A couple of examples:

⁹ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

careless intellectual and ideological blindness. And to the extent that, during this process, the nature and severity of the global ecological crisis have been misrepresented and belittled, such attacks go beyond the mere "academic game." Many of these academic theorists seem to have lost their way, remaining in ecological ignorance.¹⁰ In what follows, I will examine these critiques from postmodern theorists, social ecologists, ecofeminists, and others, and try to reexamine the position of the deep ecology movement as it has developed since Rachel Carson and the Sierra Club¹¹ by David Brower in the early 1960s, passing through Paul Ehrlich and Arne Naess in the 1970s, up to the present day.¹²

I. THE POSTMODERNS, THE "NEW CREATIONISTS"

Scientists Barbara Ehrenreich and Janet McIntosh refer to postmodern theorists as the "New Creationists" who hold that biology is irrelevant to understanding humans.¹³ For example, Stanford philosopher John Dupre asserts that "even thinking of ourselves as a biological species in the usual sense—that is, a group that possesses common tendencies or 'universal properties' that might shed some light on our behavior - is

¹⁰ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹¹ One of the largest and most influential conservation organizations in the United States. *N. from trans.*

¹² "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out*, page 237).

¹³ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

'essentialist'¹⁴". He quotes Clifford Gertz, an early advocate of social constructivism, as saying that "our ideas, our values, our actions, even our emotions are, like our own nervous systems, cultural products" that have nothing to do with biological evolution. "Some of the strongest rejection against the biological", affirm Ehrenreich and McIntosh, "comes from scholars with a left-wing or feminist perspective (...)". In the case of postmodernists, that rejection has become a dogma, much like Biblical creationists do, and they respond harshly to intellectual disagreement with that dogma. But, according to these authors, "by portraying human beings as pure products of the cultural context, secular creationists not only make biological mistakes but also defy common sense." Ehrenreich and McIntosh conclude that "this climate of intolerance, often imposed by left-wing scholars, is inconsistent with an academic tradition rhetorically committed to human freedom. And what's worse, it provides intellectual support for a political perspective that sees no real basis for arguing that humans of different sexes, races, and cultures have something in common."

The modern separation between sciences and humanities (and now between "hard sciences" and humanities/social sciences) has a long history, going back at least to Descartes. In 1969, Paul Shepard, in his development of an "ecology of man," discussed the gulf between the sciences and the humanities, how the left saw evolutionary theory as leading to social Darwinism and eugenics, and how both the sciences (in its mechanistic stage) like the humanities, had led to a culture that was alienated and hated Nature.¹⁵ In his recent book on deep ecology (*The Culture of Extinction*), philosopher Frederick Bender acknowledges postmodernism's exorcism of Eurocentrism in anthropology. But, like Ehrenreich and McIntosh, he argues that the tide of postmodern relativism is beginning to turn and that an idea of "universal cultural design" is receiving support from ethology, primatology, hominid paleontology, linguistics, and the like. Paleolithic archaeology. For Bender, one of the keys to understanding the biological basis of human nature is Mary Midgley's concept of "open instincts". Based on this "universal design", Bender joins Shepard's "Paleolithic counterrevolution" against modernity.¹⁶

Examining more deeply the roots of the "New Creationism" Nature/Culture debate, Michael Zimmerman, in *Contesting Earth's Future: Radical Ecology and Postmodernity*, summarizes the emergence of French postmodern thought. This began, according to him, after the failed European student revolution of 1968, when French intellectuals moved away from Marxism and utopianism. The Nazi holocaust, accompanied by the then recent revelations about the Soviet gulag, made the main fears and concerns of French postmodernists political: protecting democracy, promoting social justice, and

¹⁴ See note xxv. *N. from trans.*

¹⁵ For example: "In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined." (*Earth's Revenge*, page 166).

¹⁶ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

avoiding totalitarianism and fascism, even if all this resulted in nihilism. French intellectuals sought inspiration in the antihumanist critique of modernity developed by Nietzsche, Heidegger, and the anthropologist Levi-Strauss.¹⁷

Not surprisingly, for these three thinkers, the rejection of humanist modernism was accompanied by the rejection of anthropocentrism. Fred Bender argues that Nietzsche, with his idea of "perfect nihilism" as a joyful affirmation of "fidelity to Earth", could be considered "the first philosopher of deep ecology".¹⁸ Heidegger criticized the humanistic anthropocentrism of modernity for its aggression against the Earth. Most surprising to me is Levi-Strauss's critique, in 1962, of Jean-Paul Sartre's humanist existentialism. Sartre was the quintessential French anthropocentric Enlightenment humanist: with his promotion of unlimited Eurocentric progress and his rejection of human science for its alleged strict cause-and-effect determinism, which he believed undermined the possibility of human freedom. Sartre has been described as the "anti-Nature philosopher"; his goal, according to Sartre himself, was "to rescue the entire species from animality." For him, humans are totally free and unlimited (what Pete Gunter refers to as "the infinite man"). In contrast to his fellow French existentialist Albert Camus, Sartre was a biophobe.¹⁹

According to Zimmerman, Levi-Strauss affirmed that "anthropocentric humanism has justified the extermination of thousands of species, each of them as valuable as the human". In a similar way to John Muir's critique of "Master and Master Man"²⁰, Levi-Strauss argued that his anti-humanism was not misanthropic but criticized the cocky arrogance of modern humanity, a humanism that "turns man in the lord, in the absolute master of creation". Levi-Strauss preferred the "humility of primitive peoples", pointing out that "concern for humanity without joint and simultaneous concern for other forms of life (...) [leads] humanity to self-oppression and self-exploitation". The French postmodernists (Derrida, Foucault, and Lyotard), as Zimmerman points out, "focused on human, social, and cultural issues, downplaying Levi-Strauss's and

¹⁷ Examples:

¹⁸ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁹ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

²⁰ "Lord Man" in the original. *N. of the trad.*

Heidegger's critiques of modernity's assault on nature." ".²¹ Many centuries before, his compatriot Rousseau had argued that Europeans were becoming too civilized and needed to go back to Nature. However, there is a direct lineage in French philosophy that links, through Sartre, Descartes' Christian mind/body dualism, contrary to nature, with Derrida. Postmodernists have rejected modernism when it comes to human society but, unlike the thinkers who inspired them (Nietzsche, Heidegger, and Levi-Strauss), they have failed to address the issue of anthropocentrism and the destruction of wild nature. by modern humanity. So the French postmodernists have extended a central part of the Enlightenment project by developing convoluted theory and theoretical linguistic constructs designed to boast of humanity's uniqueness and superiority and, at the same time, cast doubt on the existence of a Independent nature of human language and culture. For postmodernists, humans are not biologically part of Nature.

The politicization of science and ecocide

Ehrenreich and McIntosh further point out that "postmodern perspectives go beyond a critique of the misuse of biology to offer a critique of biology itself that extends to all of science and often to the very notion of rational thought. ". Ehrenreich and McIntosh value Foucault's idea that power is everywhere, even in what is presented as truth, as one of the strengths of postmodern analysis. Thus, as a holdover from Marxist analyses, postmodernists assert (according to Zimmerman) that "what passes for objective truth is a construction generated by power-motivated elites." To counter hegemonic control of the truth by the ruling elite, postmodernists argue that "truth should be the result of negotiations in which as many voices as possible are heard." Zimmerman goes so far as to suggest that even Arne Naess's²² T-Ecosophy is a power-motivated approach, because it promotes Naess's striving for Self-actualization and his desire to be in wild places.²³ Postmodern theory about truth allegedly serves its demo-

²¹ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

²² Ecosophy-T is the name given by Arne Naess to the scale of values and worldview that guided his decisions regarding his relationship with nature. According to Naess, each person should have and develop their own ecosophy. In his case, he named it "T" for Tvergastein, a Norwegian mountainous area where Naess had a cabin. To go deeper into Naess's concept of ecosophy and specifically in Ecosophy-T, see his book *Ecology, community and lifestyle*, Cambridge University Press, 1989. *N. of the trad.*

²³ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "Like photosynthesizers[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

cratic concerns while at the same time delegitimizing any biological understanding of humans and, in essence, undermining the continuing quest for truth in the theoretical sciences. objective (or impartial). When the world is viewed exclusively from the perspective of political 'power', the truth, like everything else, must be 'negotiated'.

Although Ehrenreich and McIntosh agree that "science needs rigorous and ongoing review," they agree with evolutionist Stephen Jay Gould when they say that "some facts and theories are truly universal (and true)—and no cultural tradition can change that." - (...) we cannot allow a supposedly friendly left current to be exempt from criticism from anti-intellectual positions". Of course, this runs counter to the postmodern claim that all knowledge is socially constructed, and in particular calls into question Donna Haraway's view that knowledge should only be "relative" and local. But there are legitimate ways of knowing that are both universal and local. For example, paleontologist Niles Eldredge points out that hunter-gatherer peoples have a deep understanding of their local ecosystems. His classification of plants and animals coincides, often exactly, with that developed by biologists. Eldredge concludes that "when we compare lists of plants and animals made by local people with those of professional biologists, it confirms our idea that species are real entities in the natural world, and not simply figments of the classificatory imagination of the human being. Western world": in other words, knowledge is not so culturally relative and reducible to "social constructions".²⁴

The distinguished ethical theorist Bernard Williams also recently criticized both postmodernists and pragmatist Richard Rorty for denigrating and relativizing the concept of truth. Williams says that deconstructivists "start from the startling assumption that the sociology of knowledge is in a better position to state the truth about science than science is to state the truth about the world." Physicists and biologists are also unsatisfied with the careless politicization of, and subjective mistrust of, their specialties.²⁵ So we have both the right and the left politicizing science to serve their respective agendas.

In an article on social constructivism and deep ecology, Mick Smith states that I maintain that (1) "current scientific theory [is] an adequate and unalterable representation of the world as it really is (...) which gives us a privileged access to *the* truth", (2) that by supporting the genetic *theory*, I am also supporting its *technological applications*, (3) that although I criticize anthropocentric humanism, in reality, I remain within the enlightened modernist paradigm in supporting the natural sciences in their

²⁴ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

²⁵ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

attempt to provide a true description and understanding of Nature, and (4) that Paul Shepard and I are sociobiologists and biological determinists for holding that biology has an important role to play in understanding human behavior and nature.²⁶ Smith's claims seem to me to represent typical postmodern fallacious arguments of the type discussed above. Due to my training as a philosopher of science, I am quite aware that science undergoes changes. Smith seems deliberately to ignore my explicit statements about the need to be skeptical of a science ever reaching the final and complete Truth. I also make the usual distinction between theoretical science and its applications (applied technoscience); I support the first while I have serious reservations about much of the second. With respect to (4), in essence, as discussed above, I agree with the analyzes presented by Ehrenreich and McIntosh and by Fred Bender.

Inspired by Spinoza's ideas about the three levels of knowledge, Arne Naess (a major theoretical philosopher of science) makes a decisive distinction between the "contents of reality" and the "structure of reality". Naess's description of "Gestalts" as the fundamental "contents" of reality is his version of *non-dualism*.²⁷ Theoretical science, for its part, provides a description of the *structure* of reality, and both its contents and structure are independent of the relativization of social construction. As a philosophical analysis of knowledge, I think Naess is on the right track, which of course contradicts and weakens the postmodern sociological analysis of truth and knowledge.²⁸

In February 1992, timed to coincide with the UN environmental conference in Rio, the US National Academy of Sciences and the Royal Society of London (recognizing, in essence, the correctness of early analyzes of Paul Ehrlich and other environmentalists of the 1960s and 1970s) jointly announced that world population growth of almost 100

²⁶ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²⁷ Briefly explaining all these philosophical concepts (non-dualism, gestalt ontology, etc.) is difficult. To facilitate the understanding of this paragraph, it could be said, by way of summary, that Naess took the concept "gestalt" —whose approximate translation could be "set"— borrowed from psychology as the basis for a way of understanding reality that would flee from the reductionist mechanism. Gestalt psychology starts from a holistic notion according to which the whole is more than the sum of its parts. For Naess, Reality, as we experience it, is made up of a dynamic and intricate whole of hierarchically related gestalts, and these gestalts are more than mere parts of a whole. That is, larger sets are not reducible to a series of smaller sets. According to Naess, there are no dualisms of the type subject/object, substance/property, universal/particular, fact/value, etc., because everything is related and integrated in a Gestalt Reality.

²⁸ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

million people a year was the "fundamental reason" for forest loss, global warming, and the rate of extinction of species. They said that "the future of the planet hangs in the balance" and called for the rapid stabilization of the world population. Later that same year, 1,575 scientists from 69 countries, among the world's foremost, including 104 Nobel laureates, signed the 1992 World Scientists Notice to Humanity, stating that "human beings and the world natural have conflicting paths (...) we, the undersigned, members of the world scientific community, warn all humanity of what awaits us. A great change is necessary if enormous human suffering is to be avoided and our global home on this planet is not to be irretrievably mutilated (...) There is only one or a few decades left before the opportunity to avert threats is lost. what we are now facing

(...)". In 1993, fifty-eight National Academies of Sciences from around the world came together to draft a similar declaration. Recently, Lester Brown has analyzed the exponential global ecological deterioration that has continued to take place after the Rio conference and the warnings of world scientists.²⁹

It is significant that Fred Bender begins *The Culture of Extinction* with a detailed 40-page scientific summary of the global ecological crisis: from overpopulation, global warming, and ozone depletion, to biodiversity loss, habitat destruction, ecosystem collapse, toxic pollution, ocean degradation, loss of arable land, freshwater scarcity, and deforestation; the set of what he calls "ecocide". Business-as-usual³⁰ policies, such as sustainable development, could allow us to grow for a few more decades. Drawing on computer models from the 1990s by Donella Meadows and others, Bender asserts that strong evidence suggests "that the point at which the carrying capacity of the planet will be exceeded and collapse will occur will be within the present century." unless major social change takes place rapidly (current ecological footprint analyzes indicate that carrying capacity actually began to be exceeded in the 1970s). A similar analysis, specifically focused on species extinction and habitat loss, has been conducted by University of Hawaii researcher Franz Broschimmer in his book *Ecocide*. Current estimates are that 30,000 species are going extinct every year, compared to 1,000 species a year in the 1970s, in what scientists call the Sixth Mass Extinction of Species. The analyzes of the global ecological crisis provided by Bender and Broschimmer reflect the general consensus among world scientific organizations.³¹ Arne Naess, like Bender, has considered various scenarios stemming from the collapse of ecosystems for the twenty-first century that, according to him, could result in harsh totalitarian measures by governments aimed at restoring order. Naess hopes that a more rational deep ecology

²⁹ "Red pine" in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

³⁰ "Business as usual" in the original. This expression, which could be translated as "continue as usual" or "continue as before", was widely used by the authors who in the 1970s studied the limits to growth and made predictions about the consequences of population growth and consumption. With it they referred to social and economic policies and trends that did not take these limits into account. *N. from trans.*

³¹ Page 114.

approach will avoid both ecospheric collapse and totalitarian measures.³² By seeking to undermine the impartiality and "objectivity" of the natural and biological sciences, *the postmodern social constructivist stance undermines the credibility of scientists' warnings about the ecological state of the world.*

Of course, the refusal to accept the global ecological scientific consensus completely changes the landscape in terms of social priorities and the need for radical world-view and social change. For decades, the political right, through Julian Simon and his followers, has criticized the scientific consensus, saying there is no such thing as an overpopulation problem or a global ecological crisis. In 1995, a book by environmental journalist Greg Easterbrook was published stating that the environment is better than ever. Easterbrook is influenced, in part, by the New Age approach of Pierre Teilhard de Chardin.³³ More recently, the left has found its ecological maverick champion in the young Danish statistician Bjorn Lomborg, who, inspired by Julian Simon, has questioned all the data about deforestation, species loss, population growth rates, global warming etc Lomborg says he is a "boy on the left" who wants to use all the money unnecessarily wasted on ecological protection to promote development in the Third World and feed the poor. As the situation has evolved, Simon and Lomborg's irresponsible views have become a worldwide scandal. Ehrlich and Diamond show that Simon is ignorant when it comes to ecology. As for Lomborg, the scientific *establishment*, led by Peter Raven and other members of the American Association for the Advancement of Science, rushed to refute his theses in the pages of *Scientific American* and other posts. More recently, a team of scientists (the Danish Committee Against Scientific Fraud) examined Lomborg's book and decided that it is academically fraudulent. However, they charitably concluded that Lomborg basically overdid it by not really understanding the nature of the issue at hand.³⁴ Was criticizing the views of Simon and Lomborg simply another Foucauldian power play by scientists (as Zimmerman and postmodern social constructivists would say), or was it rather an attempt by scientists to clarify the done for the long-term good of the interests of humanity and the Earth?

The religions of the world against the New Creationism

As we have seen, the new generation of postmodern environmental historians and neopragmatic "ecophilosophers" has become increasingly conservative and reactionary toward evolutionary science and the global ecological scientific consensus, and has, in fact, slowly regressed toward the traditional Western "anthropocentric shelter". As the philosopher Roderick French has pointed out in relation to the traditional Western

³² "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

³³ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

³⁴ "Sweat lodge" in the original. *N. from trans.*

anthropocentric approach, “it is very disturbing (...) to consider the idea that the formation of human consciousness through the study of literature, philosophy, history, religion and other related disciplines can, in fact, inculcate values and behaviors that endanger the continuity of life itself.”³⁵

Christian theologians have traditionally given one of lime and another of sand with respect to the ecological crisis but, starting in the 1980s, under the push of the ecologically radical Catholic theologian Thomas Berry and Mary Tucker, professor of the course on “Religions of the World and Ecology” at Harvard University (which was influenced by Berry), significant progress has been made in alerting and radicalizing world religious leaders about the catastrophic nature of the global ecological crisis and the rejection of anthropocentrism.[28]

In 1997, the Patriarch of the Greek Orthodox Church, Bartholomew I, made the following statement:

Committing a crime against the natural world is a sin (...) That humans cause the extinction of species and destroy the biological diversity of God’s creation (...) that humans degrade the integrity of [the] Earth by causing changes in its climate, stripping it of its natural forests or destroying its wetlands (...) that humans contaminate the Earth’s waters, its soil, its air and its life with poisonous substances, all of them are sins.

Earlier, the Pope had shocked the world with his statement about the overwhelming evidence supporting Darwinian evolution. In June 2002, Bartholomew I and John Paul II issued a “Joint Declaration” on the environment stating “our desire that [God’s design] be developed through our cooperation to restore its original harmony.”³⁶

Religions, in both rich and poor countries, are beginning to take a leadership role in addressing the global and local dimensions of the ecological crisis. For many years, the Dalai Lama has been an outspoken advocate for ecological responsibility and the protection of Tibet’s ecosystems and wildlife. Buddhist monk Sulak Sivaraksa is a leader of the Assembly of the Poor, which combines social justice and ecology approaches to protect forests and wildlife (and the home of indigenous people) in Thailand. Sivaraksa, Thich Hanh, Gary Snyder, and the American Buddhist/deep environmentalist Joanna Macy have been recognized as instrumental figures in leading Buddhism around the world into a new third phase of social and ecological activism. Furthermore, the Brazilian Christian theologian Leonardo Boff has written that, since the late 1960s, liberation theology has progressively moved from a concern for the poor, starving blacks and Indians, and the oppression of women, towards a new concern for ecological theology and spiritual ecology focused on the destruction of wild species and ecosystems and based on their “autonomy” and “intrinsic value”. Boff says that “according to this theology,”

³⁵ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

³⁶ “DNR” in the original. “Department of Natural Resources”. *N. from trans.*

in which humans and society "are an integral part of Nature," "social injustice becomes ecological injustice."³⁷

The conflict between a worldview of free market capitalism and unlimited economic growth and an ecological worldview was clearly highlighted in 1995, when Thomas Berry made the dramatic claim that "we are already on the verge of a total [ecological] dysfunction of the planet (. . .) [which] requires a drastic reduction in the plundering processes carried out by the industrial commercial economy [and] a drastic and total change in the way of life". This is in stark contrast to New York pundit Thomas Friedman and his staunch support for economic globalization (*The World is Flat*) whereby American super-consumer lifestyles spread to China, India and the farthest corners of the globe; the rich get richer while the poor get poorer; and multinational companies rule more and more over the world. George Monbiot wrote last year [2005] in *The Guardian* that the modern economy sees unlimited growth as the cure for all the world's ills, while global warming "makes our economists look like fanciful utopian..." At the 2004 Parliament of the World's Religions in Spain, which emphasized spirituality and ecology, Rabbi Michael Lerner received the highest praise for his critique of globalization as a "heartless religion of the Market." "—a global worldview that "acts like a proselytizing religion, promising salvation through consumption, technological gadgetry, and economic power."³⁸

The most radical religious/ecological statement to come out recently is the World Church Council document "God's Earth Is Sacred" (available on their website). In it, the idea of "business as usual" is rejected and calls for a drastic reduction in consumption and economic production, along with the protection of ecosystems and species. Confronting the global ecological crisis, he says, is "the most important moral imperative of our time." Yet the most flagrant omission of this entire radical ecological religious awakening, from Thomas Berry to the World Church Council, *is the lack of any reference to human overpopulation!* They have accepted and promoted most of the global scientific consensus except for one of its most important aspects. They need to study Diamond's *Collapse* and the Ehrlichs' *One with Nineveh* and represent the world from global ecological analysis and critique.

While the religious leaders of the world are now taking ecologically radical positions and aligning themselves with the global scientific community and the position of the deep ecology movement, the right-wing Republican movement of the George W. Bush administration, the "Wise Use movement"³⁹, finds himself in collusion with apocalyptic

³⁷ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

³⁸ "National forests" in the original. *N. from trans.*

³⁹ The "Wise Use movement" emerged in the United States in 1988 (although its origins date back to the mid-1970s) as a pressure group and social movement in response to the approval of different laws—for example the Wilderness Act—that protected public lands or regulated their use. In this movement, different sectors of the American right are grouped together, financed by extractive industry companies (oil, lumber, livestock, etc.), who defend that the economic and social well-being of humans

Christian fundamentalists who see ecological collapse as “a good sign”. Journalist Glenn Scherer provides a rare analysis of “end times” anti-ecological apocalyptic Christians and how they have seized political control of the US Congress. The same analysis was echoed by veteran journalist Bill Moyers when, in In 2004, he received the Global Environment Citizen Award from Harvard Medical School.⁴⁰

What an irony that scholars as educated as postmodern leftist deconstructivists end up as “new creationists” who take scientific and ecological positions similar to those of right-wing Christian biblical creationists! And now, some theologians (who have traditionally been dogmatists) are at the forefront of the radical ecological movement, while philosophers, supposedly without prejudice (such as neopragmatists), have been left behind, turned into anthropocentrists with little concern for ecology. Ecophilosopher Jack Turner (in *The Abstract Wild*) comes very close to expressing my thoughts when he says that, despite his training in the Western philosophical tradition, he “distrust[s] that tradition, its means and its ends, although it continues to be at your service.”⁴¹ Given the current reactionary stance of most of Western philosophy (including the new generation of “ecophilosophers”), which seems unable to overcome its anthropocentric biophobic past, I am beginning to feel more sympathetic to the radical ecological theologians of the world.

***II. FROM GUHA TO CRONON: THE POSTMODERN DECONSTRUCTION OF WILD NATURE⁴²

The most recent phase of critiques of Wilderness⁴³ began in 1989 with the Indian social ecologist Ramachandra Guha who, in a highly influential article, assumed the role of mouthpiece for the Third World providing a “Third World critique.” [3. 4] Calling himself an “outsider sympathizer,” Guha said the deep ecology movement is nothing more than a radical strand of the US wilderness movement that has little relevance to the *real* issues. environmental challenges facing humanity—social justice, overconsumption by the wealthy, and militarization (Guha sees these as “the greatest dangers to the integrity of the natural world”). Guha goes even further, suggesting that “in the American context, a truly radical ecology movement should work for a

must take precedence over the protection of nature and that There is no objective or material limit to growth and progress. *N. from trans.*

⁴⁰ “Buckskin” in the original. Name given especially to deer skins (“buck”) tanned without hair and with primitive techniques. *N. from trans.*

⁴¹ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

⁴² “Wilderness” in the original. The term “wilderness” refers to ecosystems and areas with little or no humanization. Depending on the context it can be translated either as “wild nature” (for example, in this case) or, more frequently, as “wild ecosystems”, “wild territories” or “wild areas”. In this text, unless explicitly stated otherwise, it has been translated as “wildlands” or “wild ecosystems”. *Trad. No.*

⁴³ “Wilderness” in the original. *Trad. No.*

synthesis between appropriate technology, alternative ways of life, and a movement for peace.” Guha euphemistically refers to India as a ”densely populated country.” By any realistic ecological perspective, India is grossly overpopulated and has now rapidly overtaken China as the world’s most populous country. Given the global ecological scientific consensus, one is stunned to see such a characterization of the ecological crisis.

Guha is upset with the nature reserves established in India in the 1970s by Prime Minister Indira Gandhi, in collaboration with international conservation organizations, to protect tigers and other endangered species. Guha rejects the view that ”intervention in nature should be guided primarily by the need to conserve biological integrity rather than human needs.” In his view, India’s tiger reserves (which also protect many other endangered species) are an example of ”elitist ecological imperialism” resulting in ”a direct transfer of resources from the poor to the rich.” Guha also asserts that US parks and wilderness areas⁴⁴ (like those in the Third World) are designed primarily as tourist attractions for the wealthy. ”Deep Ecology,” he says, ”runs parallel to consumer society without seriously questioning its ecological and sociopolitical foundations.” Ecological issues, for Guha, are first and foremost issues of human social justice. Moreover, the anthropocentric-biocentric⁴⁵ distinction of deep ecology is ”largely false”. He dislikes deep ecology’s attraction to Eastern traditions such as Taoism, Hinduism, and Buddhism as bases for its ecocentrism, claiming that such attraction is politically motivated to provide an ”authentic lineage” and to present itself as a universal philosophy (and not as a particular American philosophy).

Guha cites the book *Deep Ecology* by Devall and Sessions, however that book, even with its flaws, contains enough information to head off most of their mistakes about deep ecology. If you had read the book more carefully, you would have realized that the deep ecology movement is not exclusively focused on the wilderness. For example, bioregionalism is highlighted in the book as an ecologically sound way of life for people around the world. There is criticism about inappropriate technology. In this book, Guha would also have found criticism about excessive consumption by the rich. The Hindu author dismisses the attraction to Eastern religions as a ”political ploy” without seeming to realize that, for example, Arne Naess is a recognized world authority on Gandhi’s philosophy and that he incorporated Gandhi into his own philosophy. ecological (Ecosophy-T). In addition, Gary Snyder trained for ten years as a Zen monk in Japan and bases his philosophy and practice of deep ecology on Zen.⁴⁶ In short,

⁴⁴ ”Wilderness” in the original. *Trad. No.*

⁴⁵ ”Biocentric” refers, in this case, to the defense of absolute respect for the Biosphere and wild ecosystems and *not* to the defense of the sacredness of individual life. It would therefore, in this case, be synonymous with ”ecocentric”. *N. from trans.*

⁴⁶ ”Wise-use movement” in the original. The ”Wise Use” movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social

Guha's knowledge of the deep ecology movement appears to be grossly distorted. And Guha is not the "impartial" or representative spokesman for the Third World that many take him to be. There are many people throughout the Third World who place a high priority on efforts to protect biodiversity and wilderness in their countries. What's more, he is not even necessarily a representative spokesman for India. For example, the famous Hindu physicist/ecofeminist Vandana Shiva argues that deep ecology's insistence on the intrinsic value and protection of wild species and habitats is the only way to ensure a long-term healthy lifestyle for the world's poor.[36] Despite his mistakes, however, Guha puts his finger on the nerve: the issue of displacing indigenous peoples from their homes to create reserves to protect wild ecosystems, endangered species, and the continuation of the evolutionary flow of nature. Wild nature.

A much more systematic and exhaustive critique of the concept of Wild Nature⁴⁷ was developed from 1991 by J. Baird Callicott, one of the most prominent popularizers of Leopold's land ethic. Summarizing Callicott's position, he first says that John Muir's original reason for protecting wilderness was for aesthetic and spiritual value. But this is misleading, Muir also rejected the anthropocentrism of what he called the "Owner and Lord Man": for Muir, non-human wild beings have the right to exist by and for themselves, which requires the protection of great extensions of wild territories that serve as their habitat. Thoreau was the first modern thinker to stress the crucial importance of protecting Earth's wildness; Muir agreed with Thoreau and emphasized the role of anthropocentrism in the destruction of the wild.⁴⁸ Secondly, according to Callicott, the conservation of wild areas⁴⁹ is a defensive strategy that, in the long term, has everything to lose. Third, similar to Guha, Callicott says that wilderness is a uniquely American, non-exportable concept, driving the eviction of indigenous peoples from their homes in the remaining wilderness of the Third World. Fourth, it is an ethnocentric concept. No wilderness is pristine (untouched by the hand of man): Native peoples managed and, in certain cases, altered the landscape through fire and other means. Fifth, recent ecological theory says that ecosystems are in a process of constant change and instability, while according to Callicott, wilderness conservation assumes ecosystem stability. And sixth, by excluding permanent human occupation, the concept of wilderness reinforces a real and philosophical separation between humans and nature.

Unlike Guha and his colleagues, who focus exclusively on social justice, Callicott has extensive knowledge of the ecological literature and is aware of the need for the protection of ecosystems and species. He proposes replacing the concept of legally declared wild areas⁵⁰ with that of "biodiversity reserves", to protect biodiversity and

well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

⁴⁷ "Wilderness" in the original. *N. from trans.*

⁴⁸ "Between villages there is a death zone" in the original. *N. from t.*

⁴⁹ "Wilderness" in the original. *N. from trans.*

⁵⁰ "Wilderness" in the original. *N. from trans.*

ecological habitats. But in their anthology *The Great New Wilderness Debate*, Callicott and Michael Nelson insist that these “biodiversity reserves” must be *managed*. What do Callicott and Nelson have against unmanaged *wildness*? Do they feel the need to “control Nature” through their management? Perhaps the most insightful debate took place between Callicott, conservation biologist Reed Noss, and Dave Foreman. Noss and Foreman seem to respond satisfactorily to most of Callicott’s arguments.[38]

In addition to his alternative of biodiversity reserves, Callicott supports the concept of “sustainable development.” Biologist Edward Grumbine has refuted Callicott’s proposal for sustainable development. Sustainable development involves too much management and development, and is tied to Callicott’s vision of a “global technological society.” Grumbine argues that Callicott provides “very little about the kind of limits” that will be necessary for future ecologically compatible societies.⁵¹ Callicott appears to be totally oblivious to the vast body of literature critical of sustainable development. And, like the reformist leaders of environmental organizations in the 1980s, Callicott seems to have returned to an earlier “limits to growth” analysis, while promoting the much less radical position that Fred Buell calls “ecological modernization.” “. On the other hand, Arne Naess has proposed replacing the ecologically flawed concept of sustainable development with that of “ecological sustainability”.[40]

Postmodern social constructivism entered the debate dramatically in the work of environmental historian William Cronon, “The Trouble with Wilderness; or Getting Back to the Wrong Nature”.⁵² In 1995, excerpts appeared in the *New York Times Magazine* and other newspapers, with titles like “Inventing the Wilderness” and “Is Wilderness a Threat to Environmentalism?” In 1990, the noted environmental historian Donald Worster engaged in debate with the new postmodern environmental historians. Worster said that Cronon and Carolyn Merchant were trying “to reduce environmental history to social history and to adopt the causal arguments and moral concerns of the latter—the importance of gender, race, class, etc.” Cronon has so broadly redefined the environment as a cultural landscape that it could almost “encompass anywhere on Earth, including hospitals and military bases.”[42]

Cronon’s article makes use of Guha and Callicott’s arguments, but adds the post-modern theme that Nature and wilderness are cultural concepts that *need* to be “reinvented”. Cronon’s style seems unusually ambiguous and winding, and much of the force of his argument rests on that. For example, Cronon says that “wildlands represent a serious threat to the responsible environmentalism of the late 20th century.” But are you talking about the concept of wilderness or the physical landscape to which that concept refers? It turns out that both. For Cronon, the Euro-American idea of wilderness is romanticized and based on historical inaccuracies, such as not taking into account the extent to which the Earth’s surface has been altered from its “pristine” state by

⁵¹ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

⁵² 1 mile is approximately 1.6 km. *N. from t.*

indigenous peoples. . Following Callicott, Cronon says his criticism "is not directed against wilderness, or even against efforts to preserve large tracts of wilderness." But this is tricky, because Cronon ultimately sides with Guha. For Cronon, the "bottom line" is that "responsible environmentalism" needs to be redirected from protecting vast wilderness areas around the world (for wild species and protecting biodiversity) towards a concern for our "backyards": places like cities and other areas where we "live, work and play".

Cronon's insights into ecological science seem somewhat scant: for example, he says that the genetically domesticated tree growing in our backyard is just as wild and "different" as one growing in a mature forest. In a valuable ecological critique of Cronon, conservation biologist Donald Waller draws Cronon's attention to the tree example and explains how conservation biologists understand and classify wild ecosystems.⁵³ Referring to another example of such scientific confusion, David Kidner (in his excellent critique of social constructivism) criticizes Cronon for suggesting that many of the dramatic global ecological problems (global warming, depletion of the ozone layer, loss of biodiversity) "they exist primarily as simulated representations in complex computer models of natural systems." [44] Is Cronon suggesting that scientists are fabricating and "constructing" global ecological problems, thereby downplaying these problems in order to focus on local urban pollution and issues of social and environmental justice?

Any doubts about the direction that Cronon and his postmodern colleagues are taking should be dispelled by taking into account the orientation of the participants and the issues raised at the "Reinventing Nature" conference (organized by Cronon and inspired by his article), held in 1994 at the University of California at Irvine. The title of the conference is taken from the famous work "Cyborg Manifesto"⁵⁴, by Donna Haraway, who also participated in the conference. For example, Richard White analyzed the struggle to protect the old-growth forests of the Pacific Northwest in terms of workers (loggers) versus recreationists⁵⁵, while downplaying ecological issues. Candice Slater and Carolyn Merchant accused environmentalists of trying to return to a lost paradise of pristine and wild Nature. Giovanna DiChiro promoted the fusion between environmentalism and social justice. Katherine Hayles spoke of the convergence of virtual reality with experiences arising from the natural world. It is significant that the ecologist Daniel Botkin was invited to Cronon's conference, although he was unable to attend. It appears that Botkin also rejects "limits to growth" and the global ecological

⁵³ In this regard, see also the presentation of "There where man is a visitor" by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocentrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocentrica/all-donde-el-hombre-es-un-visitor>].

⁵⁴ There is a Spanish translation: "Manifiesto for *cyborgs*: science, technology and socialist feminism at the end of the 20th century" in Donna J. Haraway, *Ciencia, cyborgs & women: the reinvention of nature*, University of Valencia, 1995, pages 251-311. N. of the trad.

⁵⁵ "Recreationists" are those people or organizations that defend the protection of nature based on its recreational value. N. from trans.

scientific consensus. Donald Worster has criticized Botkin for wanting to develop most of the Earth to the point where it has become "a comfortable home" for civilization. "In the twenty-first century, nature," according to Botkin, "will be a nature made by us." But what will then happen to the wild species and ecosystems that have made the Earth a system capable of supporting life?⁵⁶

Conference participants went on field trips to Disneyland, Sea World and South Coast Plaza with their Nature Company to see how the corporate world is "reinventing" Nature. If more "reinventing Nature" conferences are held in the future, a more appropriate field trip would be to the National Museum of Natural History in New York to watch biologists "invent" Nature. In 1998, Niles Eldredge, the curator of the museum's Biodiversity Hall, presented a major exhibition called *Life at Play*. It explained the functioning of ecosystems, the values of biodiversity, human dependence on wild ecosystems and what could be done to avoid the Sixth Mass Extinction of Species. In the book that accompanied the exhibition, Eldredge makes an impassioned call to protect biodiversity and species habitats that is, in itself, a profound refutation of postmodern deconstruction. Eldredge says that "remaining anchored in the idea that we have escaped from the natural world, few see the true dependence that our species has on the health of the global system." If you can't make it to that exhibition, Botkin and the other participants in the "Reinventing Nature" conference should read Eldredge's little book!⁵⁷

Gary Snyder has little patience with Cronon and postmodernists. He points out that early ecologists understood that ecosystems were in flux and change. Many pre-agricultural societies cause a relatively minimal impact on the environment, which is why, in many cases, these territories should be called "*virtually pristine*" instead of "pristine".⁵⁸ Snyder says that Cronon and Botkin's positions are "simply the most sophisticated development of the 'Wise Use movement'". Cronon and postmodernists fail to realize that "wilderness is where large and rich ecosystems are found and is therefore (among other things) a place to live for beings that cannot survive elsewhere." habitat type."⁵⁹

David Orr (whose strong views on ecological issues have, over time, come to rival those of Snyder, Arne Naess, and Donald Worster) provides an excellent summary and

⁵⁶ "Wilderness" in the original. This term refers to lands and ecosystems that are little or not at all humanized. Depending on the context, it can be translated in various ways: "wild lands", "wild territories", "wild areas", "wild ecosystems" or, more generally, "wild nature". In this text it has been translated as "wild nature" except in cases where it is explicitly indicated otherwise. *N. of t.*

⁵⁷ "Wilderness" in the original. *N. of t.*

⁵⁸ "Wildness" in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply "wild nature". Here, except where otherwise noted, it has been translated as "the wild character." *N. of t.*

⁵⁹ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

assessment of what he calls "the Debate." Not-So-Great about the Wilderness. The basic assumption—that Nature can be reinvented—"is only useful if one considers it an ephemeral social construct. If Nature is so liberated from its ties to rigid physical reality, it can be redefined however one pleases." Cronon's assertion that we should redirect our attention to the "wildness" in our backyards is an "insignificant idea" when we must "cope with global problems like species extinction, climate change, emerging diseases and the collapse of entire ecosystems. Orr refers to historian Peter Coates' claim that "irresponsible deconstructivism undermines arguments for the conservation of threatened species". Like Snyder, Orr also sees postmodern perspectives as similar to those found "only on the political far right." He concludes that "postmodernism provides no realistic basis for a viable and intellectually sound environmentalism."⁶⁰

The "wilderness debate" from Guha to Cronon is only a small part of much larger leftist "culture wars" and socio-political intellectual conflicts. You also need to look, for example, at urban planner Robert Gottlieb's book *Forcing the Spring*. Mark Dowie aptly refers to it as "a milestone in the revisionist history of environmentalism" emphasizing urban pollution and humane environmental justice as the essence of environmentalism. Gottlieb's research is superficial, describing "old wilderness conservationists" as concerned with protecting wilderness primarily for scenic and recreational reasons. It also describes biologist Rachel Carson as fundamentally concerned with questions of pesticide pollution and "quality of life," while ignoring her broader ecological and anti-anthropocentric stance. Gottlieb points out that the New Left (inspired by Paul Goodman, Herbert Marcuse, and Murray Bookchin in the 1960s) was proposing a post-scarcity urban and social environmentalism focused on pollution, new technologies, and the problem of overconsumption (very similar to what Guha does today). The purpose of Gottlieb's book is to make the case for the revival of New Left urban environmentalism.⁶¹

Dowie extends Gottlieb's analysis and program for a "new urban environmentalism." Using typical leftist rhetoric, he calls old wilderness conservationists "racist" and "elitist" (a few were but not the majority) and shares the "shift in emphasis from the natural to the urban sphere, that has transformed American environmentalism (...). The fundamental concern of the new movement is human health. Its supporters consider the conservation of wild territories as (...) something respectable but overrated".⁶² Dowie does a good job of detailing all the weaknesses of the environmental movement and organizations that, in the 1980s and 1990s, came under attack from the Republican right and demands from the left to adopt their justice agendas. urban social security as the main objective, have ended up being increasingly ineffective and increasingly disorganized and confused about their priorities. But Dowie's scant knowledge of ecological

⁶⁰ "Wilderness" in the original. *N. of t.*

⁶¹ "Rambunctious garden" in the original. It is an allusion to *Rambunctious Garden* which, as the author points out below, is the title of a book by Marris in which he defends the domestication and management of the Biosphere. *N. of t.*

⁶² "Breakthrough Institute" in the original. *N. of t.*

realities and of the ecological scientific consensus results in him placing questions of social justice above ecological ones. Like most urban/social justice environmental theorists who hail from the political left traditions, Gottlieb and Dowie appear to be ideologically blind to the details of the historical and biological foundations of the environmental/conservation movement as it developed over the years. based on the writings of Rachel Carson and David Brower's leadership of the Sierra Club during the 1960s. In his book, Gottlieb cites the most important studies in the history of this movement (*John Muir and his Legacy* by Stephen Fox and *The History of the Sierra Club* by Michael Cohen) but seems not to have taken on the biological/ecological message. For the left (including postmodern deconstructivists) everything is seen in terms of "race, class and gender." For Gottlieb and Dowie, the early conservationists/ecologists were all "racists" and "elitists". And now we have Carolyn Merchant (a leading postmodern/ecofeminist environmental historian) who ignores John Muir's extraordinary ecological understanding and achievements and claims that he was a racist.⁶³

Ultimately, environmentalism's version of social justice and the New Left (originated by Bookchin and Marcuse and now resurrected by Gottlieb, Dowie, Guha, Cronon and the postmodernists) should be contrasted with these observations by Gary Snyder:

Deep ecology thinkers insist that the natural world has value in its own right, that the health of natural systems should be our primary concern, and that such concern is also the one that best serves human interests (...) It's good that the scope of the movement ranges from wildlife to urban health. But there can be no health for humans and cities apart from the rest of nature. A proper radical environmental stance is by no means anti-human. We capture the pain of the human condition in all its complexity and add recognition of how desperately threatened certain key species and habitats are.⁶⁴

⁶³ "Think tank" in the original. Think tanks are usually organizations made up of multidisciplinary theorists and intellectuals who express their opinions on[https://es.wikipedia.org/wiki/Pol%c3%adtica_social][social policy,][https://es.wikipedia.org/wiki/Estrategia_pol%c3%adtica][political strategy,][<https://es.wikipedia.org/wiki/Econom%c3%ada>][economic o[<https://es.wikipedia.org/wiki/Militar>][military,][<https://es.wikipedia.org/wiki/Tecnolog%c3%ada>][technology]o[<https://es.wikipedia.org/wiki/Cultura>][culture .]They are characterized by having some kind of ideological [https://es.wikipedia.org/wiki/Ideol%c3%b3gica][n] orientation and are often related to military laboratories, private companies and academic or research institutions. another type. His works usually have an important weight in politics and public opinion, particularly in the United States. *N. from t.*

⁶⁴ "Wilderness" in the original. *N. of t.*

III. BOOKCHIN, SOCIAL ECOLOGY AND THE NATURE/CULTURE DUALISM

Foucault, in general, was right – power is almost everywhere and, of course, also in leftist (and postmodern) tendencies, who see everything as power politics. As Fred Bender (a former Marxist scholar) has pointed out, beginning with Marx, the left has rejected religion, including religious spiritual traditions that provide an understanding of reality that includes techniques to temper ego's dominance. And now postmodernists reject reason and unbiased evidence (the search for truth) in favor of (often incendiary) rhetoric. This was never more evident than in Murray Bookchin's virulent political power play when, in July 1987, at the first American Greens conference in Amherst, Massachusetts, he took the podium to rail against deep ecology (and promote deep ecology). society).⁶⁵ Deep ecology has been promoted by Fritjof Capra and Charlene Spretnak, in their book *Green Politics*,⁶⁶ as the basic philosophy of The Greens. Bookchin's diatribe included the claim that deep ecology is a "black hole"—a "bottomless abyss in which diffuse forms and ideas of all kinds can be completely sucked into a toxic ideological dump." Deep ecology is misanthropic in seeing humanity as something "ugly" and anthropocentric that is "overpopulating the planet, devouring its resources and destroying its wildlife and the biosphere" (Bookchin at least got this last part right - and him? Are those things okay with you?) Along with his violent rhetoric, Bookchin hits all the rhetorical points of the right, with various accusations that have become the standard repertoire of leftist critiques of deep ecology: for example, linking Earth First! Foreman (and Michael Zimmerman's promotion of Heidegger's philosophy as a basis for the deep ecology movement) with ecofascism and Nazism.

The controversy appeared in the pages of *The Nation*. Kirkpatrick Sale saw a "planned and coordinated campaign" when he engaged in a debate with Bookchin and his colleague, Ynestra King, at the Conference of Socialist Scholars in 1987, where they inveighed against deep ecology and bioregionalism.⁶⁷ During a major ecofeminist conference held at the University of Southern California in 1987, King also said that "there is only one ecology, and that is social ecology." Alston Chase points out how Sale was repeatedly interrupted while giving a talk on deep ecology/bioregionalism at an earlier conference at UCLA ("International Green Movements and the Prospects for a New Environmental/Industrial Politics in the US") co-sponsored by the author of <em

⁶⁵ "Untrammelled by man" in the original. It refers to a famous and controversial section of the US Wilderness Act (section 2c). *N. from t.*

⁶⁶ Secondary growth forests, or secondary forests, are forests that have grown again after being felled and that, after a sufficiently long period, are in the process of recovering, so that the effects of felling cease to be appreciable. Secondary forests are different from forests that regrow after natural disturbance (early serial forests), such as fire, pests, wind, etc. since they largely lack the nutrients, as well as the protection against erosion or the capacity to retain water in the soil that dead trees provide. *N. from t.*

⁶⁷ "America's federally designated wilderness system" in the original. *N. of t.*

>Forcing the Spring, Richard Gottlieb.⁶⁸ Chase, who is right-wing and critical of deep ecology, says that Gottlieb (and Bookchin) were trying to extend the New Left model of the German Green Party to the United States: “environmentalism has not replaced Marxism but has been absorbed by him. Sale concluded that Bookchin, King, and the others were “really determined to destroy the influence” of the deep ecology movement.

Fred Bender has little sympathy for social ecology, which he calls “the human chauvinism of the left.” He asserts that “social ecology and ecofeminism continue to develop the traditional concerns of the historic left, particularly the analyzes of, and opposition to, class and gender domination and unwarranted inequalities rooted in Extinction Culture.”⁶⁹ In her study of the political approaches to the environment of Marxists, ecosocialists, and the New Left, political scientist Robyn Eckersley notes how Marx, like Locke and other classical liberals, “considered the non-human world as a mere terrain.” for human activity, which only acquired value when it was transformed by human work or its prolongation —technology”. In this regard, the entire leftist tradition has not deviated substantially from the original Marxist position. Eckersley proposes two “litmus tests” to determine whether an ecological position is adequate: concern about overpopulation and the protection of wild territories (understood as the habitat of wild species). Both Bookchin’s social ecology and ecofeminism fail miserably on both tests.⁷⁰

As the intellectual leader of the New Left, Bookchin was hostile to the ecological approach pioneered by William Vogt and continued by Paul Ehrlich (the terrifying “neo-Malthusians”) that warned of overpopulation, overconsumption, and loss of wilderness and wildlife habitats. , and defended the existence of limits to human growth and expansion. According to Robert Gottlieb, “the ecological question for Bookchin was fundamentally an urban question.”⁷¹ Bookchin proposed a “post-scarcity anarchism” in which human resources and production are apparently unlimited (so there is no problem of overpopulation). Ecologist David Ehrenfeld quotes Bookchin as saying: “For the first time in history, technology has reached an open end. The potential for technological development (...) is virtually unlimited”. Ehrenfeld criticizes Bookchin’s “boundless optimism” and asks: why does he embrace “the unwarranted optimism of a humanistic cult whose efforts to redesign the world in its own image have yielded nothing but a long string of ever-worsening failures”? Fred Bender points out the irony of how Julian

⁶⁸ There is a partial Spanish translation of “A Sandy County Almanac” in *An Earth Ethic*. Waterfall Books, 2005.

⁶⁹ Literally “Dust Bowl”, “Dust Bowl” is the name by which the phenomenon is known in English that in the 1930s affected the plains and prairies that stretch from the Gulf of Mexico to Canada. The soil, stripped of moisture, was blown up by the wind in great clouds of dust. The drought-resistant grasses of the original prairie ecosystem were replaced by wheat crops that, failing due to drought, left the soil bare, creating dust storms of unprecedented magnitude. *N. from t.*

⁷⁰ There is a Spanish translation of “Thinking like a mountain” in *An Ethics of the Earth*. Cataract Books, 2005. *N. from t.*

⁷¹ “Wildness” in the original. *N. from t.*

Simon appropriated Bookchin's post-scarcity leftist ideas, transforming them into a "right-wing" argument for unlimited and "unfettered" "free enterprise" growth![61]

In a 1988 article on the new ecophilosophies, there is a photograph of Bookchin conversing with Marxist ecologist Barry Commoner at the 1987 Conference of Socialist Scholars. Chris Lewis notes that in 1990 Commoner (in his book *Making Peace with the Planet*⁷²)

It refuses to accept calls to control population growth, stop economic growth and development, and transform the modern world. It argues that, because humanity lives in two worlds, the natural world or ecosphere and a social world of its own creation—the technosphere [Nature/Culture]—, the environmental crisis is not an ecological problem but a social and political problem.⁷³

Today, the Commoner-Ehrlich debates of the 1970s must be seen in a new light: Ehrlich representing the ecocentric scientific/ecological branch of the environmental movement (which would eventually become the global ecological scientific consensus based on equation $I = PAT$) and Commoner essentially representing the anthropocentric political agenda centered on urban pollution of the New Left. The fundamental accuracy of Ehrlich's analyzes and efforts was recognized by the scientific community when he was recently awarded the first Service to Humanity Award by the American Association for the Advancement of Science.

In 1989, Eckersley provided a critique of Bookchin's philosophical ecology centered on his teleological interpretation of evolution as a process leading to greater diversity, complexity, and freedom, with humans at the top rung of the evolutionary ladder. For Bookchin, humans have created a "second nature" that has evolved from "first nature"—again, the old Nature/Culture dualism. According to him, it is necessary for humans to incorporate Nature into Culture, thus adding "the dimension of freedom, reason and ethics to the first nature" in a new dialectical synthesis that he calls "Free Nature". Marx had divided Nature and Culture into the realm of necessity and freedom, respectively, and Bookchin's distinction between first and second nature obviously reflects that separation. Comparing Bookchin to the French Jesuit priest Pierre Teilhard de Chardin, Eckersley worries that Bookchin was willing to bioengineer wild "first nature" and "take the reins of evolution in those fields where he already let us know its address and be ready to, and be able to, give it a hand".⁷⁴ For Bookchin, letting nature and wild species "follow their own evolutionary destinies" (in the words of Gary Snyder), on their own, would mean that humans would be "too passive."

Bookchin claims to be in the tradition of Aristotle, Hegel, and Marx. In 1974, at the dawn of ecophilosophy, the Australian philosopher and historian John Passmore hit the nail on the head in pointing out what is ecologically wrong throughout the Aristotelian and Hegelian/Marxist tradition.⁷⁵ For Aristotle, "nature reaches its optimum when

⁷² There is a Spanish translation: *In peace with the planet*, RBA, 1994. *N. of the trad.*

⁷³ Norse. *N. from t.*

⁷⁴ "Self-willed" in the original. *N. from t.*

⁷⁵ "Arctic National Wildlife Refuge" in original. *N. from t.*

it completely satisfies the needs of man—which, in fact, constitutes its reason for existing (...)" This tradition continued, according to Passmore, with Fichte's German idealist metaphysics and Hegel and was incorporated into the thought of Marx, that of the New Left, that of Marcuse (and Bookchin) and that of Teilhard de Chardin. Marcuse continued with Fichte's ideas by saying that there are "two types of human dominance: one repressive and the other liberating (...)" At the same time that [man] civilizes nature, he frees it, as Hegel also suggests, from its 'negativity', of its hostility towards the spirit". Non-human nature must be humanized and spiritualized. In Hegel's Christianized dialectical philosophy, there was no lost love for Nature. Bender says that, like the modern philosophical basis for the Culture/Nature dualism, Hegel held that Nature had no intrinsic value. He quotes Hegel as saying that humans should "abuse her (...) and annihilate her." Hegel also affirms that "man being Spirit is not a creature of Nature".⁷⁶

Bender argues that the Nature/Culture distinction is ultimately false and unsupported by biology and other sciences; contemporary human cultures remain completely imbued with wild Nature and natural processes. His critique of Bookchin's social ecology continues along the lines developed by Eckersley. Bender says that "social ecology's vague notion of 'free' nature amounts to nothing less than absolute planetary management, in support of massive, paternalistic intervention in evolution itself." But Bookchin's position is even more disastrous and dramatic. After attempting to establish that humans, through their Culture, have abandoned Nature—evolving outside of it in the completely separate realm of Culture—Bookchin would return humans to Nature to *integrate* it. totally in culture. "Free nature" is the form that Culture would take after engulfing Wild Nature. So *everything will be culture!* The Hegelian tradition is so anthropocentric, so nature-hating, and (in Hegel's case) so unearthly that it is difficult to see how an adequate ecophilosophical position could originate from it. Dialectics is also often used to insinuate the inevitability of progress that, in many cases, is highly questionable.

Thomas Berry has tried to unravel the vast anti-ecological implications of the non-human Wilderness focus of mainstream Western philosophical and religious traditions. As a disciple of Teilhard, Berry has attempted to reinterpret Teilhard from an ecocentric perspective. Contrary to both Teilhard and Bookchin, he says that "the evolutionary process reaches its maximum expression in the Earth community, seen in its global dimension and not only as a human community that reigns triumphantly dominating the rest of the components of the Earth. Land". The spontaneous course of evolution and wild Nature must be respected and protected.⁷⁷

According to Bender, John Clark is currently "the ablest philosopher" of social ecology. Clark maintains that the most characteristic statement of social ecology is that "the human drive to dominate nature (...) is, primarily, the result of the domination of

⁷⁶ "Wildness" in the original. *N. from t.*

⁷⁷ "Wilderness" in the original. *N. from t.*

some humans over others.”⁷⁸ Warwick Fox has criticized that view, and Eckersley appears to agree with Fox.⁷⁹ Bender also argues why this claim of social ecology cannot be true: for example, historically, anthropocentrism has preceded the domination of some humans over others. Bender also criticizes Clark’s attempts to defend the anthropocentrism of social ecology. Bender notes that Clark now considers himself a “deep social ecologist.” He has tried to distance himself from Bookchin’s position and now says he supports bioregionalism and “a vast expansion of wilderness.” But what is the priority that the protection of biodiversity (along with the other aspects of the *ecological* crisis) has in Clark’s new adaptation of social ecology? And what is the position of the new “deep social ecology” on overpopulation, “post-scarcity anarchism” (unlimited growth), and the idea that humans drive evolution by absorbing wild Nature into humans? culture? Clark now apparently supports (along with Michael Zimmerman) Ken Wilber’s anthropocentric Hegelian spirituality. Does Clark agree with Wilber that primitive peoples have a less developed form of spirituality?⁶⁹ Bender thinks otherwise. More recently, Clark has tried to form strong links with ecofeminism. Which leads to the question of your opinion about social constructivism and Donna Haraway’s “Cyborg Manifesto”.⁸⁰

Clark has recently said that my approach and Naess’s are so different from each other that they represent two different conceptions of deep ecology.⁸¹ Over the years I have criticized Bookchin’s social ecology for many of the reasons mentioned above, while Naess (in a more Gandhian style) has tended to be conciliatory. Clark notes that Naess argues that the deep ecology movement should be kept separate from social justice concerns (ideally, according to Naess, these movements should unite and cooperate, where possible, under the umbrella name of Green movement). I agree with Naess’s tactical approach to this issue, but Clark doesn’t. To the best of my knowledge, I do not disagree with Naess on any major deep ecology issue, including the delicate issue of the ecological consequences of overly liberal immigration policies from poor to rich countries. Naess has pointed out, for example, that “the children of immigrants will adopt the dire consumption habits of rich countries, thereby increasing the ecological crisis,” not to mention the added stress on ecosystems and social infrastructure that they are causing. growing population pressures. In other words, there are *limits to growth* unless, of course, one believes that Culture has become totally detached from biological/ecological reality (these considerations are serious enough not to be ruled

⁷⁸ *Idem. N. from t.*

⁷⁹ The author refers to the discovery of large geometric figures of earth (geoglyphs) in certain areas of the Amazon basin. See, for example, “Environmental impact of geometric earthwork construction in pre-Columbian Amazonia,” John Francis Carson, Bronwen S. Whitney, Francis E. Mayle, José Iriarte, Heiko Prümers, J. Daniel Soto, and Jennifer Watling, in *< em>PNAS*, July 7, 2014. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>][<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>]. *N. from t.*

⁸⁰ Genus *Megatherium. N. from t.*

⁸¹ 1 foot = 30.48 cm. *N. from t.*

out). as a Garrett Hardin-style “racist” stance). Given the equation $I=PAT$, environmental scientists today refer to the United States as “the most overpopulated country in the world.” And both Jared Diamond and the Ehrlichs have said that immigration to developed countries should be substantially reduced for ecological reasons.⁸² This is a key terrain where leftist social justice movements (and, apparently, “second generation” ecophilosophers) appear to be moving away from sound ecological and social politics. Clark also totally disagrees with Naess and me on this. Finally, one is forced to ask what social ecology as an *ecophilosophical* stance might look like if Clark acknowledged the criticisms made by Eckersley, Fox, Bender, and others.

The incredible strategy of postmodernism - everything is Culture!

The social constructivism of the postmodernists provides a new and original basis for the resolution of the Culture/Nature question. There is no such thing as a Nature/Culture dualism—Nature either becomes a social construction wholly dependent on Culture, or is wholly integrated into, or eliminated by, Culture. This constitutes an intellectual strategy of such magnitude that it makes Bookchin’s attempt at influence seem minuscule by comparison. For example, Australian zoologist Peter Dwyer has said:

Modern thought treats nature as something separate from culture and has assigned the former an ontological priority (...) I would like to modify and, to a certain extent, turn that tradition upside down (...) I will say that, in the sphere of human affairs, culture must be placed first and nature in an emergent position.⁸³

But, unless we are Biblical Creationists, Hegelians/Marxists, or Postmodern “New Creationists,” Culture is not “separate” from Nature. Humans and their cultures emerge from cosmic and biological processes and remain fully embedded in those processes. Bender provides ample arguments to support the belonging of humans to Nature. The Earth and many other species have historical ontological priority over humans. By rejecting the scientific explanation of the evolution of the Universe, calling into question the veracity of the physical and biological sciences, the postmodernists have, in effect, turned things “upside down” in a huge attempt to achieve power that has implications in many ways. practical issues (such as the priority of social justice issues over ecological ones). They have turned things “upside down” to the point of turning reality inside out -*it’s all Culture!* Through an intellectual sleight of hand, the social sciences now become the fundamental or “sciences”. hard”, while the physical and biological sciences become the “soft” sciences dependent on culture. This bizarre intellectual power coup has been so successful that today the anthropocentric social sciences and humanities are holding the reins! Today, as a result of their newly acquired position of power, such sciences provide a new and unique intellectual basis for the ecological destruction of the Earth and its savageness only dreamed of before by Old Testament authors and modernist thinkers of the Enlightenment, from Bacon, Descartes, Hegel, Marx, and

⁸² Rodents of the genus *Dipodomys*. N. from t.

⁸³ *Ambystoma tigrinum*. N. from t.

Bookchin, to the techno-utopian Nouveau followers of Teilhard de Chardin in Silicon Valley.

As a way of summarizing the critique of anthropocentric postmodernism and its potentially devastating social and ecological impacts, I would like to refer to Paul Shepard's insightful little essay "Virtually Hunting Reality in the Forest of Simulacra". After analyzing the approaches of Derrida, Rorty, Lacan, Lyotard and Foucault, Shepard says,

But is [postmodern deconstruction] really new, or is it a continuation of an old and unnatural stance that David Ehrenfeld has called "the arrogance of humanism"? (...) As tourists flock to their (...) fantasy worlds, cynics take refuge from daunting problems by announcing that all lands are illusory. Deconstructivist postmodernism rationalizes the last step to remove the connection: from relativism to denial. It seems more like the final act of an old story than a revolutionary perspective.

And recalling Nietzsche's "perfect nihilism" (the cheerful affirmation of "fidelity to the Earth"), Shepard points out, as an alternative, the genuine and innovative direction of our time is not the final surrender to the anomie of nonsense or the flight to fantasy worlds, but the opposite direction—towards affirmation and continuity with something beyond representation. The new humanism is not really radical. As Charlene Spretnak says: "the greening of consciousness is much more radical than the ideologues and strategists of current political forms (...) seem to have realized."⁸⁴

IV. ECOFEMINISM AND THE DEEP ECOLOGY MOVEMENT

Ecofeminism has been germinating since the mid-1970s, but burst onto the ecophilosophy scene in 1984 with Australian sociologist Ariel Salleh's article "Deeper than Deep Ecology: The Ecofeminist Connection."⁸⁵ Several ecofeminists, including Patsy Hallen, have pointed out that much of the development of ecofeminism has taken place in reaction to deep ecology.⁸⁶ Most ecofeminists (like Bookchin and his social ecology), with the notable exceptions of Charlene Spretnak, Hallen, and a few others, have seen ecofeminism as in deadly competition with deep ecology. Before the attacks began, deep ecology theorists naively and positively looked at both social ecology and ecofeminism. Salleh's article was the beginning, and with few exceptions, ecofeminists have uniformly misunderstood the deep ecology movement; as a consequence, most of his criticism has been far from on target. For example, Salleh thought that deep ecology is a "masculine" rational and ethical system (which is not true) and that women are physically and emotionally closer to Nature than men (it seems obvious that in

⁸⁴ "Pleistocene rewilding" in the original. *N. from t.*

⁸⁵ "De-extinction" in the original. *N. of t.*

⁸⁶ "National Public Radio" in the original. It refers to an American radio station. *N. of t.*

alienated cultures contemporary women, this varies fundamentally according to the individual experiences of each man or woman). As a Marxist, Salleh has recently charitably attempted to "help" deep ecology by proposing that it place less emphasis on consciousness change and more on the "material" conditions of life.⁸⁷

The question of the alienation of male deep ecology from Nature (most deep ecology *theorists* are male) has been a central theme of ecofeminist critiques up to the present day. [Since most ecofeminist intellectuals are highly urban-focused postmoderns and social constructivists, one might more convincingly argue that such intellectuals are some of the most remote-from-Nature people in the world.] Mountaineer/philosopher Jack Turner points out that because people who spend a lot of time in the wilderness and on mountaintops often have a broader perspective on reality, it is no coincidence that many modern conservation leaders (John Muir, David Brower, Arne Naess, George Sessions, Gary Snyder) have been mountaineers. Brower used to complain that the Sierra Club was often run by mountaineers, but beginning in the 1980s, it was run by MBAs and other bureaucrats and lost its boldness and ecological perspective. In the same vein, the philosopher William Barrett referred to Henri Bergson's comment that "most philosophers seem to philosophize as if they were locked in the privacy of their office and did not live on a planet surrounded by a huge organic world of animals, plants, insects and protozoa, with whom his own life is linked in a single story. Barrett thought that the "first lesson (of trees and rocks) is to get us out of the narrow and presumptuous horizons of our humanism." Although Naess is often cited as the "father" or "founder" of the deep ecology movement, such a claim is misleading. Naess says the founder of the movement is marine biologist Rachel Carson. In his original 1973 article on deep ecology, Naess notes that "enormous numbers of people in all countries," many of whom were field ecologists (both male and female) who identified with Wild Nature, have come to spontaneously to similar deep ecological attitudes and beliefs. Naess saw himself as providing the philosophical articulation of a global deep ecology movement that had already been in existence for a decade.⁸⁸

Cheney, Plumwood and Warren on Deep Ecology

Val Plumwood and Karen Warren are two of the most prominent contemporary ecofeminist scholars, both initially drawing heavily on the work of Jim Cheney. Cheney introduced postmodern ecofeminism to the world of ecophilosophy in the late 1980s. Influenced by Donna Haraway, he defended local bioregional⁸⁹ narratives and criticized the position of Warwick Fox, whom he accused of promoting a "cosmic iden-

⁸⁷ "Wilderness" in the original. *N. of t.*

⁸⁸ "The wild" in the original. *N. from t.*

⁸⁹ Bioregionalism is a movement that emerged in the early 1970s in the United States. This movement defends that human communities and groups can face the catastrophic consequences of human activities on ecosystems terrestrials trying to live in harmony with the bioregion in which they live. For bioregionalists, the natural characteristics of each region (biological, climatic, geographical, etc.) are what must determine the lifestyles of those who inhabit it, who must strive to know in depth the nature that surrounds them and to create communities sustainable and efficient that develop the potential of the region they inhabit without exceeding its ecological limits. Bioregionalist ideas are profoundly vol-

tification " universal and rational, instead of worrying about the particular, the social, the historical, the personal and the "politics of difference". Cheney then developed a convoluted analysis claiming that followers of "S-Ecosophy" (for "Stoic," "Self-realization," or both)—namely Warwick Fox, Bill Devall, Sessions and to a lesser degree Naess—are committed to a "metaphysical project of salvation" that places the deep ecology position "out of reach for negotiation." Like the Stoics' reaction to the destruction of the ancient world, alienated male followers of S-Ecosophy want to climb a "[metaphysical] tower that stands beyond tragedy" (Robinson Jeffer's phrase) to escape the demise of modernism. Of course, it was Naess who was initially inspired by Spinoza's metaphysical system, and Cheney simply *assumes* that postmodern deconstruction (with its rejection of metaphysics, truth, etc.) is the correct position. But even the criticism of Cheney by the Stoic academic William Stephens, in which he says that his comparison of deep ecology with Stoicism is inappropriate and that the argument is fundamentally *ad hominem*, has not deterred Cheney. ecofeminists to continue using it.⁹⁰

Karen Warren's 1999 article "Ecofeminist Philosophy and Deep Ecology" is the most recent example of ecofeminist critique of deep ecology.⁹¹ Warren is familiar with the Eight Principles program⁹² but begins his article by characterizing deep ecology in the terms used in Naess's original 1972 statement and, throughout his article, uses both [the program and the statement] indistinctly. It seems strange that, at this point, Warren is still unable to understand that the Eight Points program and the 1984 Apron⁹³ Diagram *superseded* the 1972 statement. She claims that the program of the Eight Principles itself is predisposed towards the "masculine", but at no time does it try to explain this affirmation. The main question of ecofeminism, according to Warren, is that "if patriarchy were eliminated (...) the rest of the 'isms of domination' would also be eliminated (including 'naturism' or unjustified domination of non-human nature by part of humans), *since* patriarchy is conceptually linked to the rest of the 'isms of domination' through the logic of domination". Responding to Warren, Arne Naess

untaristic and, in general, tend to be highly influenced by communitarianism and other leftist ideologies. *N. from trans.*

⁹⁰ "Impact investing" in the original. It refers to investments, in companies or organizations, theoretically made with the intention of generating a social or environmental benefit apart from economic benefits. *N. from t.*

⁹¹ "Wilderness" in the original. *N. of t.*

⁹² The program of the Eight Principles is a text prepared by Arne Naess and George Sessions in April 1984 with the intention of establishing some ideological bases that would serve as a glue for the then incipient movement of Deep Ecology. A Spanish translation can be read in the January 2005 issue of *The Ecologist* magazine, under the heading "What is 'deep ecology'?". *N. from trans.*

⁹³ The Apron Diagram is a diagram developed by Arne Naess to illustrate the logical relationships that develop between the many and varied philosophies, worldviews, and practices that coexist within the Deep Ecology movement. Naess himself wrote an article ("The Apron Diagram") explaining the meaning of the Apron Diagram, which was published in *The Deep Ecology Movement: An Introductory Anthology*, edited by Alan Drengson and Yuichi Inoue (North Atlantic Books, 1995, pages 10-12). *N. from trans.*

says that he supports eliminating patriarchy, but finds it "hard to believe" that such an event would eliminate domination over Nature.⁹⁴

Frend Bender has keenly grasped the "ecological claims" of both social ecology and ecofeminism and is much more critical than Naess of ecofeminism's central questioning. Although she maintains that ecofeminism has deeply examined the role of patriarchy (and of oppressive dualisms and schemas) in the rise of the ecological crisis, ecofeminists remain "considerably further from reaching the roots of the problem than might appear to the public". first glance". They are wrong to believe that androcentrism is more important to the crisis than anthropocentrism: anthropocentrism historically preceded the rise of patriarchy. The main problem with ecofeminism, according to Bender, is that, like social ecology (and the feminist movement in general), its allegiance lies more with leftist emancipatory politics than with the ecology movement (a movement with a few "very different intellectual origins").⁹⁵

Plumwood's critique of Aldo Leopold and Naess's concept of self-realization

Like many ecofeminists, Warren draws heavily on Australian Val (Routley) Plumwood's well-known critique of Naess's concept of Self-Actualization. [In 1973, Plumwood's ex-husband, Richard Routley (Sylvan), had written the first major paper in the field of environmental ethics. He defended Leopold's land ethic as a formal ethical position. Sylvan soon became a leading critic of Self-Actualization and deep ecology's ontological approach to ecophilosophy].⁹⁶ Apparently thinking that he could "clear the way" for ecofeminism by removing the inherent "male alienation" existing in the fields of environmental ethics and ecophilosophy, Plumwood launched an attack on both Leopold's land ethic and stance. of Naess's Ecosophy-T about Self-realization.

Plumwood expands on Cherney's critique to say that in accepting Leopold's land ethic one is assuming an abstract, rationalistic masculine moral scheme. However, Bender claims that Plumwood's criticisms of Leopold and Naess are completely wrong. Calling attention to John Rodman's interpretation of Leopold (with which I also agree), Bender argues, unlike Plurnwood, that the land ethic should not be separated from the general context of the *Sand County Almanac* —the book as a whole should be seen as a rejection of the anthropocentrism that gradually builds up (and leads the reader towards) the "gestalt shift" of the land ethic. Therefore, Plumwood is wrong to treat this as a formal ethical theory; Bender says that Leopold's position is actually a form of "non-dualistic" holistic ecocentrism.⁹⁷

Plumwood's critique of deep ecology focuses on Naess's personal stance on T-Ecosophy (with its Self-Actualization norm), mistakenly thinking, as Bender points out,

⁹⁴ *Idem. N. of t.*

⁹⁵ In relation to the concept of "productive landscape" see the article "Why the productive landscape doesn't work" by George Wuertner, in *Untamed Nature*:

⁹⁶ "Black-footed ferrets" in the original. *Mustela nigripes. N. of the t.*

⁹⁷ "Swift foxes" in the original. *Vulpes velox. N. of t.*

that T-Ecosophy and deep ecology are the same.⁹⁸ Drawing on postmodern concepts such as “logic of identity”⁹⁹ and “essentialism”¹⁰⁰, Plumwood says that Self-actualization is guilty of (1) *indistinguishability* (a monism in which there are no boundaries between humans and Nature—humans and nature are “identical”—), (2) *expanded self* (the sense of Self for deep ecology is fundamentally the magnified and enlarged male ego that absorbs and nullifies the “other”—a denial of the importance of difference—) and (3) *the transcended or transpersonal self* (here Plumwood uses Cheney’s critique of the Warwick Fox’s view that humans should overcome their limited personal concerns and identify impartially with all individual beings). Karen Warren also believes that the “transcended self” is one of the most serious flaws in the deep ecology approach. When Naess and I use Spinoza’s metaphysical system as a source of inspiration, Warren says that it leads to “a rational concern with the universal and the ethical as opposed to the particular and the personal.”¹⁰¹

The failure of Western intellectuals to understand non-dualism

Few ecofeminist theorists, apart from Charlene Spretnak, seem to be familiar with Eastern spiritual/psychological traditions. This also seems to be the case for all the criticisms of Naess’s concept of Self-Actualization by Western ecophilosophers, from Baird Callicott and Eric Katz to Plumwood and Warren. There are now at least *three* separate and independent critics of Plumwood (including Bender’s), all of whom say that it fails to understand the *non-duality* of Naess’s position.¹⁰² As a result, all your criticisms of Self-Actualization, as involving the ideas of “*indistinguishability*”, “*extended self*”, and “*transcended self*”, are wrong. Fred Bender was initially a Marxist scholar, but his study of the Buddhist spiritual discipline, coupled with concern for the global ecological crisis, led him to endorse the deep ecology position. Bender describes *non-dualism* as a three-step process of growing spiritual and ecological awareness: (1) starting from egoistic dualism and passing through (2) monism (the awareness that “everything is one”), until reaching (3) the resurgence of individuals who, at that moment, understand that they are ontologically integrated and interrelated with everything else. In more technical language, “ontological details reemerge as if they were both interdependent or interpenetrating details-in-relation and spatiotemporal manifestations of the otherwise unknowable terrain of being.” Bender considers Lao Tzu, Nagarjuna, Spinoza, Leopold, and Naess, among others, to be non-dualists. For example, based on

⁹⁸ “Wolverines” in the original. *Gulo gulo*. *N. from t*

⁹⁹ The author refers to the postmodern critique of the “logic of identity”. In a summarized and schematic way, it can be said that postmodern relativist philosophers consider that the act of identifying and classifying (what they call the “logic of identity”) responds to a “totalizing impulse”, to a “desire for domination”, to a “tyranny”. *N. from trans.*

¹⁰⁰ “Essentialism” is the name that postmodern authors give to any current or theory that assumes that there is an “essence”, “substance” or “nature” in things, that is, some intrinsic features that they make things what they are. As relativists that they are, these authors deny the existence of these features. *N. from trans.*

¹⁰¹ 1 square mile is roughly equal to 2.59 square kilometers. *N. from t.*

¹⁰² 1 mile is roughly equal to 1.6 km. *N. from t.*

Spinoza's third way of knowing, Naess describes the fundamental ontological reality as made up of individuals-in-relationship, understood as gestalts of a more or less high order.¹⁰³

Naess calls his concept of non-dualistic human Self-Actualization the "ecological self".¹⁰⁴ It is ironic that both Plumwood and Warren fail to understand Naess's non-dualism and claim that feminism's "relational self" is *the* correct position. And, following Naess, they refer to the "relational self" as the ecofeminist version of the "ecological self." Bender points out that Plumwood sometimes approaches non-dualism in her descriptions, but the "relational self" is really nothing more than a dualistic feminist abstraction in which one does not relate to Nature beyond one's personal and local environment. . Bender refers to him as "the caring, empathetic human individual, otherwise detached from nature." As a way of moving beyond the superficial ecofeminist "relational self" approach, Bender proposes the Gaia hypothesis as an example of "non-dual science". Lovelock and Margulis hypothesize that the biosphere as a whole is an organism: "they argue, consistent with the non-dualist idea of the interdependence of all beings, that, within the ecosphere, each thing exists by virtue of its relationships." with everything else." Therefore it should be possible to identify with the biosphere itself understood as an organic whole. Understood in a non-dualistic way, such a hypothesis does not deny each individual, as an integral member of the whole, the search for their own self-realization.¹⁰⁵

The most serious problem with ecofeminism, as Bender rightly points out, is that "ecofeminists [are] not interested in, or even hostile to, the idea that a distinctively feminist ethic of nature is based on fundamental ideas of ecology". Ecofeminism has "failed to grasp the philosophical importance of ecology" and is therefore "more feminist than ecological."¹⁰⁶ Australian philosopher Patsy Hallen is committed to both ecofeminism and deep ecology. Not an urban classroom academic, she has spent a significant part of her life in the Australian outback and other wild places around the world. In her comments on the Warren-Naess debate, Hallen agrees with Bender (and with Warrick Fox's earlier criticisms) that ecofeminists are primarily concerned with issues of social justice linked to feminism, overshadowing Nature and ecological issues. Ecofeminism, she says, needs to "bring Wild Nature to the fore."¹⁰⁷ But the postmodern and social constructivist orientation of many ecofeminists seems to make it difficult for them to

¹⁰³ "It's these feelings, wilderness-impassioned and modest and respectful" in the original. *N. of t.*

¹⁰⁴ 1984, Part II, Chapter IX.

¹⁰⁵ Ibid.

¹⁰⁶ Orwell defines freedom in a leftist and humanist framework. According to this, freedom is to be free from natural physical hardships thanks to the blessings of a human society that has subjugated wild Nature, and not being under political pressure, not being exposed to discrimination (class, race, religion, etc.), and with an income that will make it possible to enjoy the blessings of human society.

¹⁰⁷ He seems to have written 1984 as a warning for this threat. Many features of the totalitarian dictatorship described in the book were borrowed from the Stalinist dictatorship that prevailed in the Soviets at the time of the book's writing. It seems that Orwell saw the spread of this political system around the world as the greatest danger in the future.

gain any meaningful ecological understanding, as well as to accept the global ecological scientific consensus. In the case of many ecofeminists, it is doubtful that they even understand what Hallen means by the “wildness” of ecosystems¹⁰⁸.

Karen Warren’s rejection of Australian/American deep ecology and Plumwood’s analysis

Karen Warren has begun to realize this glaring deficiency and, searching for ecological references for ecofeminism, seems to have rejected Plumwood’s criticisms of Leopold and Naess. She now maintains that a rapprochement between ecofeminism and Leopold’s land ethic is necessary.¹⁰⁹ It also suggests that Naess’s Self-Realization gets rid of the accusations leveled against her by Plumwood. But like the social ecologist John Clark, Warren seems to want to drive a wedge between the Naessian and American versions of deep ecology. While Warren currently thinks that Plumwood’s critique of Self-Actualization (as well as Cheney’s of “S-Ecosophy neo-Stoicism”) does not apply to Naess, she is convinced that it does apply to Fox, Devall, and Sessions.

¹¹⁰ In his otherwise valuable 1990 book, Warwick Fox says that all major deep ecology theorists subscribe to some version of Self-Actualization and therefore concludes that Self-Actualization was the hallmark of deep ecology. Fox thus generated much of the confusion that caused the attacks on Self-Realization.¹¹¹ He then proposed that the term “deep ecology” be dropped and that deep ecology should henceforth be considered a form of transpersonal psychology. Naess immediately objected, arguing that deep ecology is fundamentally a philosophical/social activist movement and that it should be characterized primarily by the 1984 program and the Apron Diagram. A reply to Fox, supporting Naess’s position and reflecting the views of all major deep ecology

¹⁰⁸ “Ecological ‘wildness’” in the original. *N. of the trad.*

¹⁰⁹ Orwell explains the inability of totalitarian bureaucrats to reduce technology to a point before the Industrial Revolution as follows: Reducing the technology to a point below the Industrial Revolution, and most importantly, halting the development of military technology would greatly disadvantage the states which do these things in the competition with other states and would result with the destruction of the ruling classes of those states.

¹¹⁰ We see that the masses of today’s techno-industrial system, which have far better material conditions than the lower classes of 1984 on average, have a fundamentally similar attitude. Contrary to the beliefs of the progressives, the consequences of machine technology reducing physical labor and increasing material well-being didn’t turn out to be people’s dedication to “loftier” and “creative” activities. On the contrary, the indolent lifestyle created by technological development drags people into meaninglessness, creates psychological problems and dissatisfaction, and to suppress these problems to some extent, people immerse themselves in hedonistic pleasures: consumption, movies, TV series, computer games, pornography, etc.

¹¹¹ The role that Huxley and Orwell assigned to sexuality in their dystopias is diametrically opposite to each other, and Huxley’s utopia predicted the role that sexuality plays in the current techno-industrial system much more accurately. We will return to this topic in the sections where we discuss *Brave New World* and the present techno-industrial system.

theorists except Fox, was written and widely circulated by Harold Glasser in 1991 (although it was not published until 1997).¹¹²

Warren's critique of American/Australian deep ecology is dead wrong. To begin with, it attributes to Fox quotes that are from Naess, so that if he attacks Fox, he also attacks Naess. Second, it fails to realize that, since the late 1980s, leading American deep ecological theorists (Alan Drengson, Harold Glasser, Andrew McLaughlin, Devall, and Sessions) have accepted the 1984 Eight Principles program and the Apron Diagram, which differentiates the "fundamental premises" (such as Self-Actualization) of the Eight Principles program. So the Plumwood/Cheney criticisms are no longer as applicable to them as they are to Naess. This information has been readily available in the literature on the subject.¹¹³ In his reply to Warren, Naess limited himself to commenting that Warren has exaggerated the differences between theorists. Ultimately, as with Bookchin and Clark, much of the ongoing call by Plumwood, Warren and other ecofeminists for the "ecofeminism/deep ecology debate" is nothing more than academic "game" and use of power. politician to trip up the "status dispute" that has basically entangled the issues and prevented realistic solutions to the ecological crisis.

This does not detract from Warren's recent effort (along with Patsy Hallen, Charlene Spretnak, and Vandana Shiva) to belatedly marry ecofeminism with a genuine ecological perspective. In the early 1980s, Spretnak recommended that ecofeminists read G. Tyler Miller's ecological science manual, *Living in the Environment*. She has also been critical of postmodern deconstruction.¹¹⁴ But while Warren is attempting to green ecofeminism, Donna Haraway is luring other so-called ecofeminists down a techno-utopian anti-ecological path.

Haraway's cyborg proposal for the reinvention (destruction) of Nature: Postmodernism gone completely insane.

It is an extraordinary phenomenon that the West, in contrast to Eastern religious/spiritual traditions such as Taoism and Buddhism and to most primitive peoples around the world, developed such an anthropocentric tradition of Nature-hatred and that, for millennia, so few Western philosophers, with the exception of Nietzsche and possibly Rousseau, have managed to escape from it. A notable exception was the Harvard philosopher George Santayana, who produced the most radical philosophical approach of the early twentieth century. In 1911, he delivered a speech at the University of California at Berkeley condemning the anthropocentrism of American philosophy and

¹¹² Real freedom has nothing to do with doing what the system allows; it consists of having the possibility to meet one's fundamental needs with one's own abilities and initiative, individually or as a member of a small group.

¹¹³ With the developments of computer technology (like machine learning algorithms and ever more powerful processors), the system has also started to target people individually with its methods of enchantment. Contents that are shaped for specific individuals in shopping websites, video streaming websites, etc. are becoming the norm.

¹¹⁴ For the definition and a more detailed discussion of the power process, see: Theodore John Kaczynski, *Industrial Society and Its Future*, paragraphs 33-37.

religion, and rejecting the bias of his Hegelian and pragmatist colleagues. Santayana proposed an ecocentric revolution for Western philosophy and culture.¹¹⁵

The prominent British philosopher Bertrand Russell (whose orientation, it has been said, was fundamentally Spinozist) spent the years of World War II reflecting on the development of philosophy in the West, resulting in his monumental *A History of Western Philosophy*.¹¹⁶ Like Santayana, Russell observed that the philosophies of Dewey and Marx were anthropocentric “philosophies of power” and tend to regard everything that is not human as mere raw material. “. Russell concluded that these philosophies of power, which he linked with Fichte and the Hegelian tradition, are intoxicated with technological power over Nature, and such intoxication is the most dangerous form of madness in the modern world. An objective concept of truth, which Marx and Dewey rejected, helped keep the risk of “cosmic desecration” in check. [The parallels to the criticisms made by postmodernists and neopragmatists are too obvious to mention!] Finally, Russell issued a warning that, almost 50 years later, was to be spelled out in terrifying detail by world scientists: namely, that the desire of Dewey and Marx (and others influenced by those traditions) to gain social power over Nature “contributes to the growing danger of an enormous social disaster.”¹¹⁷

It is well known that Aldous Huxley, along with Zamyatin and Orwell, warned that modernity is heading towards a technological utopia that will inevitably be totalitarian. In *Brave New World Revisited*¹¹⁸ (1959), Huxley took the position that the exponential increase in human population was the main factor driving the world towards totalitarianism. Huxley’s new interest in ecology led him to write the novel *Island*¹¹⁹ (1962), a bioregional utopia based on spiritual/ecological principles. He said that his “modest ambition” was “to live as fully human beings in harmony with the rest of life on this island.”¹²⁰ It seems that Huxley would have preferred to live as a fully human, organic, and ecologically integrated being rather than as a cyborg.

Criticisms of postmodernism, social constructivism and the deconstruction of Wild Nature¹²¹ converge in the figure of Donna Haraway (famous for her “Cyborg Mani-

¹¹⁵ Some of them internalize these values so intensely that when they try to rebel against the established order they can’t think of anything else and use the system’s values to rebel against it. For a more detailed discussion of this subject, see Karaçam, “Leftism, Techno-Industrial System, and Wild Nature” and Último Reducto, “Leftism: The function of pseudo-critique and pseudo-revolution in techno-industrial society”.

¹¹⁶ There is a Spanish translation: *Historia de la filosofía occidental*. Espasa-Calpe, Madrid, 2007. *Note of the trad.*

¹¹⁷ Hans Moravec, “When Will Computer Hardware Reach the Human Brain?” *Journal of Evolution and Technology* (1998), vol. 1.

¹¹⁸ There is a Spanish translation: *New visit to a happy world*. Seix Barral, Barcelona, 1984. *N. of the trad.*

¹¹⁹ There is a Spanish translation: *La Isla*, Edhasa, Barcelona, 2007. *N. of the trad.*

¹²⁰ See “Seven Deadly Trends” in Martin Ford, *Rise of the Robots: Technology and the Threat of a Jobless Future*, Basic Books, 2015.

¹²¹ “Wilderness deconstruction” in the original. *N. of the trad.*

festos"). With his radical and "playful" ideas about "transgressing the boundaries" of distinctions ("dualisms") between humans and animals, the physical and the non-physical, organisms and machines, and the masculine and feminine, Haraway is an intellectual inspiration for those who would turn the Earth into a fully technological human construct. By way of culmination, Haraway extends Western culture's biophobic departure from a wild, organic Earth, even to the organic nature of the human body. As Michael Zimmerman describes it, "Haraway celebrates the fusion of the organic and the mechanical, the natural and the artificial, to the point of codifying the world in a way that undermines the integrity and innocence of the 'organic whole'."¹²²

Haraway's ideas of a technological utopia are not new. They are essentially a feminist and social constructivist adaptation of the techno-utopian thinking of Buckminster Fuller and Teilhard de Chardin, the intellectual leaders of the New Age movement. In a striking passage written in 1965, Teilhard foreshadows Haraway's thought:

Technology has a role that is biological (...) From this point of view (...) there are no longer any distinctions between the artificial and the natural, between technology and life, since all organisms are the result of the invention; if there is any difference, the advantage is on the side of the artificial (...) the artificial absorbs the natural (...) [Human thought] suddenly bursts in to dominate and transform everything that exists on earth.

For Teilhard, the Omega Point will be reached when the Earth is totally engulfed by the "archmolecule" of humanity living in a totally artificial megatechnologically created environment.¹²³ For both Teilhard and Haraway, the current ecological functioning of Nature is swept away while Culture, in the form of a techno-utopia, reigns supreme.

In his analysis of the development of environmentalism, Fred Buell provides a detailed critique of this type of techno-utopian fantasy which he refers to as "the culture of hyperexuberance." According to this perspective "the global eco-catastrophe ultimately becomes something fantastically desirable, and even fun". Buell speaks of Haraway and Alvin Toffler as the foundations of this kind of thinking, as well as of *Wired* magazine's Kevin Kelly, who espouses Teilhardian theology to support his views on neobiology, neo-evolution, cyberbodies and cyberecosystems as substitutes for organic Earth. *Wired* presents Julian Simon as the "exterminating angel".¹²⁴ Considering that Haraway inspired and participated in William Cronon's "Reinventing Nature" lec-

¹²² Translation by Último Reducto of "A Critique of and an Alternative to the Wilderness Idea" according to the reprint published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article in *Wild Earth Magazine* 4, No. 4 (Winter 1994/1995):54-59. © 1994 J. Baird Callicott. *N. from t.*

¹²³ US law regulating the legal protection of certain areas declared wilderness. *N. from t.*

¹²⁴ "Redneck" in the original. Although, for the sake of simplicity, it has been translated simply as "redneck" in this text, the concept of "redneck", in English and in the United States, has certain connotations, due to the social and cultural conditions of that country, which make it different from the concept of "paleto" in Spanish. On the other hand, certain non-leftist sectors of US conservationism have proudly claimed for themselves, and not without a certain amount of humor, the adjective "rednecks". *N. from t.*

ture, is Haraway's anti-ecological cyborg fantasy what Cronon and his new cadre of postmodern and anthropocentric environmental historians are actually endorsing?

Haraway's interpretation of the world as essentially 'codes' and 'information', however, reflects an old-fashioned Baconian/Cartesian mechanistic view of science, not more organic and recent views of life like the Gaia hypothesis. In keeping with her Marxist heritage, Haraway is a technological determinist who promotes such "boundary-transgressing" technologies as bioengineering, nanotechnology, and even, presumably, the "downloading" of human brains into computers. Michael Zimmerman has warned of the "death denial" impulse that drives patriarchal men to try to dominate Nature and, specifically, to merge with machines in an attempt to avoid physical death of the body and achieve immortality. Is this same "death denial" impulse now playing out in feminists like Haraway?

For Haraway, the problem of social justice (particularly the question of women's equality) has a technological solution. If historically women have been discriminated against by being identified with Nature, then their solution is to eliminate gender. Haraway would have the women reject their organic evolutionary origins and become cyborgs—part human and part machine. Racial problems can be solved in a similar way by eliminating so-called "racial" characteristics. Jean Paul Sartre would be elated—with all natural limits and boundaries transgressed, women can guide the technological future toward unlimited creativity and freedom. But does it all result in a celebration of "difference" and diversity? On the contrary, it seems to lead to a homogenization of humans and cultures such as the one that occurred in the process of US world colonization known as economic globalization.

The unabashed technological optimism and enthusiasm of Haraway, *Wired* magazine, and the New Age movement about the destruction and replacement of Earth's ecological systems have managed to blithely gloss over the all-important criticisms to the technology of the last 70 years: from Huxley, Orwell and Ellul, to the most recent critiques of EF Schumacher, David Ehrenfeld, Jeremy Rifkin and Jerry Mander. Ecophilosopher Keekok Lee has recently pointed out that the most serious global ecological threat comes from technologies that break down the distinction between the natural and the artificial. Even more sobering for Silicon Valley techno-utopians was when one of them, Bill Joy (chief scientist at Sun Microsystems), warned of the very real dangers of self-replicating systems running amok; Joy recommended a ban on new research in robotics, genetic engineering, and nanotechnology. A growing number of thinkers are calling for a moratorium on such technologies. For example, Sadruddin Aga Khan, the former UN High Commissioner for Refugees, concerned about the environment, said that "perhaps the time has come to impose a moratorium on scientific or technological innovations that have potentially negative implications for the planet and the society". Joy's analysis and recommendation may have temporarily cooled techno-

utopian tempers, but not for long, as research in such fields continues to advance at full speed.¹²⁵

It was to be expected that the ultra-postmodern deep ecology critic Peter van Wyck would agree with Haraway's cyborgism, but it was quite a surprise that Michael Zimmerman did as well.¹²⁶ Zimmerman is a Heideggerian scholar who has in the past highlighted Heidegger's critique of anthropocentric humanism, as well as Heidegger's persuasive critique of the technological world, thinking that Heidegger provided yet another philosophical basis for the deep ecology movement. But when Heidegger's close ties to the Third Reich were revealed, Zimmerman immediately abandoned it, wrote extensively on the postmodern theme of the possible dangers of ecofascism, and radically changed his position towards neo-Hegelianism [Fortunately, in his 1993 work on Heidegger and Deep Ecology, concluded that "deep ecology theorists are hardly to be confused with ecofascists."] Zimmerman ends *Contesting Earth's Future* by endorsing a number of thinkers he calls "critical postmodernists," including Ken Wilber, Alexander Argyros, and Donna Haraway. Zimmerman notes that Argyros (like the neo-Hegelian Wilber and Haraway) "does not seem particularly concerned with the fate of non-human life." Granted such a thing, to what extent can these thinkers (and Zimmerman) be considered to defend an ecological position? Teilhard's anti-ecological and anthropocentric phrase comes to mind that plants and insects have very little relevance since they are not part of the evolutionary development towards consciousness, which manifests itself to the highest degree in humans.¹²⁷

It would have been inspiring to have Donna Haraway and Rachel Carson in the same room. You would imagine that one of the most interesting topics they would talk about would be child rearing.

Carson was a strong advocate of instilling in children a "sense of wonder" toward the natural world and, like Naess, of developing strong identifiable ties to wild ecosystems, plants, and animals.¹²⁸ Haraway, I suppose, would respond by illustrating Carson about the need to "reinvent Nature," and how he would propose raising children in the electronic world of video games, virtual reality, and simulated wild ecosystems¹²⁹ to prepare them for the genderless techno-utopia of cyborgs and hyperreality. Jerry Mander explains how children growing up in our carnival-like postmodern world of theme parks and hyperreality, exposed to a constant diet of television and video games, find themselves in a state of confused reality and by being constantly "revved up"—they

¹²⁵ "Wilderness" in the original. Term that refers to lands and ecosystems that are little or not at all humanized. In these two texts, unless explicitly indicated, it has been translated as "wild zones", "wild areas" or "wild ecosystems" *N. from t.*

¹²⁶ "Wilderness" in the original. In this specific case it has been translated as "protected wilderness areas" because here the author refers specifically to the wilderness areas protected by the Wilderness Act. *N. from t.*

¹²⁷ *Idem. N. of t.*

¹²⁸ There is an edition in Spanish: *El fin de la Naturaleza*, Ediciones B, 1990. *N. of t.*

¹²⁹ "Simulated wilderness" in the original. *N. of the trad.*

become "addicted to at speed". Nature, on the contrary, is too slow and boring for them, there is no emotional contact, and this prepares the ground for the exploitation of Nature. There is growing concern among people that the younger generation will become cyborgs as a result of living inside their "electronic bubbles" and isolating themselves from the outside world – hooked on mobile phones, "ipods", laptops, etc. . Meanwhile, companies lure them into TV shows and children's ads, and later MTV for teens, turning them into American¹³⁰ superconsumers.¹³¹

It seems that Warren's work in laying a solid ecological foundation for ecofeminism is most timely. Chris Cuomo notes that ecofeminists "have banded together to appropriate Haraway's visions of an anti-dualist cyborg feminism."¹³² Warren needs to be careful, in her enthusiasm to reject *all* dualism (or distinction), not to end up also rejecting the "dualism" between the natural (or wild) and the artificial; that could downplay the Leopoldian land ethic and all the ecological foundations it wants to establish.

V. THOREAU, SNYDER AND TURNER ON THE WILD¹³³

In order to ensure the Earth's continued ecological health, there has been a renewed interest in Thoreau and Muir's nineteenth-century emphasis on the *wild*. At present, some ecophilosophers propose that the protection of the wild character¹³⁴ of the Earth is the central ecocentric question. For example, after analyzing the recent controversy between the ecological theories of stability and instability. Ned Hettinger and Bill Throop state that "the emphasis on the wild provides the most promising general strategy for defending the ecocentric ethic."¹³⁵

In *The Abstract Wild*, Jack Turner does better than anyone else the job of deciphering and interpreting the meaning of Thoreau's radical and enigmatic statement made in 1851, "In the wild is the preservation of the world."¹³⁶ Turner acknowledges his debt to Gary Snyder's *The Practice of the Wild*, which provides an innovative analysis of the wild and the "old ways" of primitive peoples from a contemporary bioregional perspective.¹³⁷ For years, conservationists and environmentalists have misinterpreted Thoreau and often distorted his words by using the expression "the wilds" instead of

¹³⁰ The author is an American who writes for readers of the same nationality. However, his analyzes and conclusions can be extended to any other technologically developed society today. *N. of the trad.*

¹³¹ The title of McKibben's book: *The End of Nature* means "El fin de la Naturaleza" in Spanish and in this book McKibben further develops the idea that, in planet Earth, there are no longer any geobiological zones or processes that have not been affected in some way by human industrial activities. *N. of t.*

¹³² "Pristine wilderness" in the original. *N. of the t.*

¹³³ "Wildness" in the original. It refers to "the wild", in the sense of the "quality of being wild" or "wild character" of something. In the remainder of the article, it has been translated as "the wild", unless otherwise indicated. *N. of the trad.*

¹³⁴ "Wildness" in the original. *N. of the trad.*

¹³⁵ "Wilderness" in the original. *N. of the t.*

¹³⁶ *Idem.* *N. of the t.*

¹³⁷ "The New World wilderness condition" in the original. *N. of the t.*

“the wild”¹³⁸. Turner points out that conservationists and ecologists have interpreted wilderness as a place (such as legally protected wilderness¹³⁹) rather than as a *quality* of people, plants, animals, and the specific places. A certain amount of human settlement does not necessarily negatively affect the wilderness of a place. As Turner points out, “A week-long stay in the Amazon, the high Arctic, or the north western Himalayas would suggest that what matters about wildness and what makes a territory wild is not determined by nature. absence of people, but by the relationship of people and place.”¹⁴⁰ The word “wild”¹⁴¹ is etymologically linked to the ideas of health, wholeness, and vivacity.¹⁴² What Thoreau refers to as “the wild” is “that which has a will, a determination, and an order of its own”[xl]. Wilderness territories must be understood as “lands with their own will” where ecological processes, not humans, are dominant.¹⁴³ The concept of wilderness goes way back in history. Criticism by Cronon and others, as Turner points out, focuses on “territories that have a ‘wildland act’”—a specific legal designation created to fit the US situation.

In saying that the wild preserves the “world,” Thoreau referred to the world as *cosmos*—as harmonious order. Summarizing this point, Turner says, “Thus, in a broad sense, Thoreau’s phrase ‘In the wild lies the preservation of the World’ may be said to refer to the relation of free ‘things’, possessing a will and self-determination, with the harmonious order of the cosmos.”¹⁴⁴ It is this spontaneous and self-determined order that we call *wildness*[xlii], which has been, until very recently, the dominant characteristic of the Earth and its flora and fauna, and which now it must be protected from further suffering irreparable destruction.

Thoreau also links the wild with freedom. In his own words, “all good things are wild and free”. Much like Naess’s concept of the “ecological self,” Turner says that for humans, wilderness and freedom are a “project of the self.” Both Thoreau and Turner agree that human freedom consists in having a “will of one’s own” and not in being mere selfish “social beings” shaped by their society. But, unlike Sartre’s existentialist position that human freedom is limitless and consists of autonomous individuals who reject and transcend wild Nature, for Thoreau freedom also implies being part of wild Nature. According to Turner, “to create a wilder self, said self must live the life of the wild, mold a particular form of character, a way of life (...). It is from this perspective of a

¹³⁸ “[...] have misunderstood Thoreau and frequently misquoted him as saying ‘wilderness’ instead of ‘wildness’” in the original. *N. of the trad.*

¹³⁹ “Wilderness” in the original. *N. of the trad.*

¹⁴⁰ “[...] what counts as wildness and wilderness is determined not by the absence of people, but by the relationship of people and place” in the original. *N. from trans.*

¹⁴¹ “Wild” in the original. *N. of the trad.*

¹⁴² “Health”, “wholeness” and “liveliness”, respectively in the original. *N. of the trad.*

¹⁴³ “Wilderness setting” in the original. *N. from t.*

¹⁴⁴ Cognitive dissonance refers in psychology to the perception of incompatibility due to the conflict between the different ideas, beliefs or emotions of a person, or between their behavior and their ideas, emotions or beliefs. *N. of t.*

wild order in complete interdependence that freedom comes.”¹⁴⁵ According to Thoreau, humans must “reintegrate into the natural world,” experiencing for themselves that they are “an integral part” of wild Nature and living bioregionally as harmonious parts of biotic communities. To achieve this wild freedom and non-dualistic perception, and minimize the socially sanctioned greed that is the basis of much ecological destruction, Turner (a practicing Buddhist) says, following Naess and Zen Buddhism, that we must also integrate a spiritual practice in our lives.¹⁴⁶

The Amazon basin, Vogel and the death of nature

Over the years, an important controversy has been generated between geographers, anthropologists and cultural historians about the extent to which the Earth has been historically modified by humans. As Charles Mann points out in an article in the *Atlantic Monthly*, some scholars say that there were more than 10 million indigenous people in North America before contact with Europeans. That huge population was decimated by European diseases, giving early settlers the impression that North America was one vast, sparsely populated wilderness. Based on that huge population and other archaeological evidence, some social scientists now claim that the indigenous population “managed to impose their will on the landscape in such a way that, in 1492, Columbus set foot on a hemisphere completely dominated by humanity.” Certain parts of the Western Hemisphere were as civilized as Europe. In some parts of South America, the human impact was so great that some anthropologists say, for example, that the Amazon basin “is a cultural artifact.” Mann draws the political and ecological implications of the above by referring to Cronon, Callicott, and “the great wilderness debate”[xliii]. And Donna Haraway and other social constructivists draw on these controversies to argue that social justice concerns should prevail in regions once thought to be untouched wilderness[xliv]. Ecologists and conservation biologists, so claim, have been wrong; there is no wild character[xlv] that needs to be saved, so the development of those regions to extract resources for humans should continue.¹⁴⁷

In this connection, it is instructive to examine philosopher Steve Vogel’s critique of Bill McKibben’s main claim in *The End of Nature*. McKibben says that with global warming now affecting every corner of the Earth, the Earth as a whole has become man-made and artificial. Vogel interprets McKibben to mean that a Nature independent of humans has come to an end—“there is no longer a world unaltered by human action.”¹⁴⁸ McKibben’s claim was not particularly well thought out and became easy prey for Vogel’s criticism. But when Vogel concluded that Nature had ceased to exist since humans began to transform it, it should have occurred to him that something in his interpretation of McKibben was seriously wrong. Vogel is enthusiastic about the elimination of Nature (or the concept of Nature) and says that he uses such arguments

¹⁴⁵ Proposal for the creation of a 360,000 km² large nature reserve on the US Great Plains. *N. of t.*

¹⁴⁶ *Cervus elaphus. N. of the t.*

¹⁴⁷ *Antilocapra americana. N. from t.*

¹⁴⁸ Approximately 160,000 m². *N. of t.*

to convince his students that Nature does not exist, nor has it ever existed. [Students put up with enough nonsense about ecology in economics and forestry classes. But what is happening today, at the hands of teachers like social constructivists, to students' fundamentally sound insights into the destruction of Nature and the wild? Sir Karl Popper's observation, made in the early 1970s, seems particularly appropriate for both Vogel and social constructivists: "The greatest scandal of philosophy is that, while all around us the natural world perishes—and not only the natural world—philosophers continue to speak, sometimes intelligently and sometimes without it, on the question of whether this world exists"¹⁴⁹.

The most glaring problem with Vogel's position is the fallacious trade-off it sets — either Nature is totally pristine (literally untouched by human hands), or it doesn't exist. Thoreau's description of the wild (and Wild Nature) deftly cuts its way through Vogel's dilemma—namely, he refers to Wild Nature as having "a will of its own" and not dominated by humans (not "untouched by human hands"). Hettinger and Throop raise the all-important point that we need to think in terms of a *continuum*, with "virtually pristine" (in Gary Snyder's words) wilderness environments at one extreme, and fully developed and dominated environments by humans on the other (as in the case of cities and areas with large-scale agriculture where most of the wild has been largely suppressed or eliminated). Although Cronon and his colleagues seem incapable of doing this, we need to be able to distinguish between New York's Central Park and the Arctic National Wildlife Refuge. Wilderness environments will become increasingly human-dominated environments as we approach the center of the continuum. This reflects the ecological reality of the situation and avoids unrealistic and misleading dichotomies such as Vogel's.¹⁵⁰

This same question applies to claims about ancient civilizations in the Amazon Basin and other areas of the Western Hemisphere. Unlike most of Europe, these regions were not totally dominated by indigenous peoples. They were still wild enough and had enough wild species[xlvi] that, after the fall of such civilizations, wild Nature gradually and spontaneously reasserted itself. Hettinger and Throop describe this process as that of humanization being "erased" from these natural systems: "early human influence on a system is lost over periods of little impact. The wildness of a system may return to its previous levels as human influence diminishes."[xlvi,123] Other biologists refer to this process as "rewilding"[xlviii], whether it occurs

[xliii] "The great wilderness debate" in the original. This is the expression with which the critical postmodern discourse with the notion of "Wild Nature" is usually called in English. *N. of the trad.*

¹⁴⁹ North American Conservation Project. A central idea of this project is connectivity between protected areas (nuclei) through corridors for wildlife. Another important idea is the creation of buffer areas around the nuclei in which human economic activities would be allowed but would be regulated to favor the conservation of biodiversity in the nuclei. The current name of the project is Wildlands Network. *N. of t.*

¹⁵⁰ "Greater Yellowstone Ecosystem" in original. *N. of t.*

[xliv] “Pristine wilderness” in the original. *N. of the trad.* [xlv] “Wildness” in the original. *N. of the trad.*

[xlvi] “Enough wildness and wild species remained” in the original. *N. of the trad.*

[xlvii] “A system can recapture previous levels of wildness as human influence diminishes” in the original. *N. of the trad.* spontaneously as if in response to deliberate and conscientious attempts to restore an area with native species — what is known as “ecological restoration”. So discussions of the extent to which the Western Hemisphere was altered by ancient indigenous peoples and civilizations are interesting but largely irrelevant to trying to protect today’s wild ecosystems. Biologists have not been wrong. They are able to recognize functional and biologically diverse wild ecosystems (such as those in the Amazon basin) when they see them. Since Leopold’s time, countless biologists have spent their entire careers in the field, studying the world’s remaining wild ecosystems. Today, many have become conservation biologists in an effort to save them. Hettinger and Throop also show how Baird Callicott, who seems to have an aversion to wildness[xlix], has modified Leopold’s land ethic to accommodate ecological instability in ways that have unacceptable consequences.

Jack Turner describes himself as a fundamentalist when it comes to Wild Nature, and most advocates of deep ecology undoubtedly agree with him. But while his criticism of the conservation biologists’ Wildlands Project for North America (expanding wilderness and connecting it through corridors) is thought-provoking and important, it is somewhat overstated. Protecting biodiversity and protecting the wild are not necessarily the same thing, and Turner points out that conservation biologists seem to be more concerned with the former than the latter. Like Callicott and Nelson, biologists are too eager to manage such areas, and wilderness and human management, he says, are incompatible. Citing Foucault, Turner points out that modernity is about human control, management and domination, and too often biologists have not freed themselves from this way of thinking. Conservation biologists counter that many wilderness areas are now too small, ecologically fragile and disconnected to sustain themselves, requiring varying degrees of management. There is also the growing problem of invasive species. Given the current state of crisis in wild ecosystems around the world, in some cases some degree of management appears to be a practical necessity. It is important to distinguish between temporary emergency measures and desirable longer-term goals.¹⁵¹

Certainly, Turner’s warnings about the danger of biologists becoming “control freaks” should be welcomed by biologists, and concerns about keeping the wild, along with protecting biodiversity, should be at the forefront of their minds. Unlike ecologists who design ecosystems using computer models and other scientists, it is doubtful that most field ecologists and conservation biologists see wild plants and animals in a mechanistic way, merely as “information”. ” or genetic “codes”, or mainly as genetic raw material for pharmaceutical companies – in other words, as mere “resources” for human use. It

¹⁵¹ “Backcountry” in the original. *N. from t.*

is likely that most field ecologists were driven to carry out extensive field studies of ecosystems (being thus in the Wild for long periods) out of love and respect for Wild Nature, and that most biologists respect the dignity, “otherness” and the right to self-realization of the creatures with whom they work. Turner goes too far in comparing the Wildlands Project to Daniel Botkin’s biophobic and power-hungry wise use plans (and those of Cronon and the social constructivists) to “reinvent” Nature.

The great insight of Thoreau and Muir was to understand that *the wild preserves the world and all its inhabitants*. From the “practical” point of view of survival, this means that the sum of all the wild ecosystems of the Earth (the biosphere) is, literally, the “life support system” of the Earth and all its species. Less obvious, but just as important, is that wilderness defines the freedom, health, and “vitality” of both humans and non-humans. It is the primary force that moves the living world. The wild must be experienced and lived, and this is why, as Western culture becomes increasingly civilized and technological, there is less and less understanding of what is being lost.

[xlvi] “Rewilding” in the original. *N. of the trad.* [xlix] “Wildness” in the original. *N. from trans.*

Recently, Turner has taken a position much like Keekok Lee—that biotech, nanotech, and other “replacement technologies” pose an immediate threat to Earth’s wild ecosystems. He focuses especially on forests and GM salmon, since those changes are imminent. Turner worries that some environmentalists might be tempted to support biotech fixes as a way to try to solve other environmental problems.¹⁵²

EO Wilson, Ame Naess and Niles Eldredge on protecting the wild

EO Wilson and Paul Ehrlich of Harvard have been an inspiration to many people involved in conservation biology. But Turner’s concerns about the acceptance of biotech fixes by environmentalists seem to be confirmed by Wilson’s view that genetically modified seeds will feed a world population of 10 billion people in the 21st century. . Wilson also says that, over time, up to 50 percent of the Earth’s surface could be protected in the form of refuges for biodiversity and wildlife. And Wilson and Norman Myers’ strategy to protect biodiversity by conserving “hot spots” for biodiversity across the Earth has been challenged by Niles Eldredge, and by the studies cited by the Ehrlichs, as totally inadequate.¹⁵³ British environmental journalist Fred Pearce rightly points out that Wilson tends to be politically naive in thinking that free-market capitalism (and biotechnology) will provide realistic solutions to the ecological crisis. Wilson seems to deny the role of the United States as the main cause of the social and ecological crisis. He suggests that the trajectory of globalization is inevitable (implying continued growth and high consumption patterns) and hopes to harness multinational capitalism’s ability to transform itself in ways that make it ecologically benign. Wilson

¹⁵² *Odocoileus hemionus*. *N. from t.*

¹⁵³ *Odocoileus virginianus*. *N. from t.*

is also criticized for his apparent lack of concern and sensitivity towards the poor living in or around the proposed biodiversity/wildlands refuges.¹⁵⁴

In the late 1980s, Arne Naess took a similar stance to Wilson when he suggested that a good mix for Earth would be around 1/3 uninhabited wilderness (wildlife refuges), 1/3 "free nature" (with a sparse human population and a predominance of the wild) and 1/3 of landscapes dominated by humans (cities and fields of intensive agriculture).¹⁵⁵ In response to Ramachandra Guha, Naess revised his views as to how much territory needed to be protected in the form of human-free havens. In his 1991 reply to Guha ("The Third World, Wilderness, and Deep Ecology"), Naess referred to "certain people" who think that deep ecology is a form of Western "neocolonialism" that proposes to drive people out of their homes. Third World people to make room for "spectacular animals."¹⁵⁶ Naess was citing Gary Snyder's point (in *The Practice of the Wild*) that throughout history, humans have lived in moderate numbers of wilderness without reducing significantly the biological richness and diversity. But today, Snyder said, this is not possible in wealthy countries like the United States, where consumerist lifestyles and other destructive practices require the establishment of vast wilderness areas¹⁵⁷ to protect wild ecosystems and the biodiversity. In addition to being desperately poor, Naess thinks that most people in the Third World care about protecting the wilderness and biodiversity. Wildlife refuges can be established where appropriate, but part of the protection might consist of people living in traditional, ecologically benign ways in sparsely populated "free nature". But since the poor can no longer enter the forests and destroy them, Naess suggests that the severe and growing overpopulation of Third World countries will require new, redesigned cities for these additional people to live in.

Niles Eldredge has proposed a strategy that combines some features of the Wilson and Naess strategies. Eldredge stresses that everything possible must be done to humanely stabilize the human population. Furthermore, "the endless cycle of agricultural land expansion" must be broken to feed more and more people. He and Naess are also in no doubt about the role of consumer patterns in the ecological crisis. Eldredge disagrees with Wilson that globalization can help solve our problems—living standards for the poor must rise, but "global economic development is pure fantasy, a pipe dream." Eldredge also says Wilson's call to protect global biodiversity "hot spots" doesn't go far enough. For Eldredge, protecting these "hot spots" is very important, but an excessive emphasis on them tends to "minimize the true magnitude of the habitat that we should conserve." The greatest emphasis must be placed on protecting wild ecosystems, not just saving species and biodiversity. Furthermore, local people affected by the establishment of reserves should be involved in these efforts. He notes that "in short, conservation is doomed unless the economic interests and well-being of local

¹⁵⁴ Another common name for the American antelope. *N. from t.*

¹⁵⁵ "Aspen" in the original. Probably *Populus tremuloides*. *N. from t.*

¹⁵⁶ *Pseudotsuga menziesii*. *N. from t.*

¹⁵⁷ "Wilderness" in the original. *N. of the trad.*

people are given serious consideration.” Eldredge believes that “ecotourism”, such as that practiced, for example, in Costa Rica, may be an option. But he warns that it is not a “panacea”—the effects of tourists on reserves disturb wildlife and have a negative impact on ecosystems.”¹⁵⁸

The solutions proposed by Wilson, Naess, Eldredge and others are difficult to apply in a world marked by growing and multiple crisis situations. As the decades have passed since environmentalists began warning of human overpopulation and the loss of ecosystems and wildlife, the destruction of ecosystems has increased exponentially and the solutions have become less clear, more desperate and more difficult. difficult to put into practice. But there is no realistic alternative to protect what remains of the wild world.

As a comforting contrast to William Cronon and postmodern historians, Donald Worster sides with Wilson, Naess, Ehrlich, and Eldredge:

We must make careful and strict conservation of the heritage of billions of years achieved by the evolution of animal and plant life our first priority. We must conserve as many species, subspecies, varieties, communities and ecosystems as possible. We must not, through our actions, cause the extinction of more species.¹⁵⁹

SAW. FREDERICK BENDER ON THE FUTURE OF DEEP ECOLOGY

Frederick Bender concludes *The Culture of Extinction* by proposing an important revision of the position of deep ecology. His view is that Naess made a basic mistake when he revised the original description of the deep ecology movement from 1973 and replaced it, in 1984, with the more philosophically neutral Eight Principles program. The 1973 version included a non-dualistic statement of the “integral relational picture—organisms as nodes in the biospheric web or field of intrinsic relationships.”¹⁶⁰ Naess also left out the “anti-class” (social justice) clause. In his proposed revision of deep ecology, Bender reinstates these and many other aspects of the original 1973 formula in a well thought out and complex reformulation of both the Apron Diagram and the Eight Principles. Bender wants deep ecology to be a global philosophical position based on non-dualism. As a partial justification for these changes, he points to Naess’s claim that the deep ecology program is supposed to provide a basis for “changing everything.”¹⁶¹ And as for Warwick Fox’s proposal to shift deep ecology toward a transpersonal psychology, Bender also says that the real “depth” of deep ecology comes not from Naess’s insistence on “deep questioning,” but primarily from the depth that its non-dualistic philosophical orientation gives it. Without this broader globality, deep

¹⁵⁸ *Pinus albicaulis*. *N. from t.*

¹⁵⁹ 1 foot = 30.48 cm. *N. from t.*

¹⁶⁰ “BLM” [Bureau of Land Management] in the original. *N. from t.*

¹⁶¹ Biblical name for greed and wealth. *N. of t.*

ecology runs the risk of being an “ecological only” movement that lacks the necessary resources to transform Extinction Culture.¹⁶²

First, Bender’s comment about “changing everything” needs to be contextualized. In his 1991 article, “Politics and the Ecological Crisis,” Naess tells us that Rachel Carson (who he says started the deep ecology movement) insisted that *everything* needed to be changed, not just politics. He agrees with Carson, though he later added the caveat “everything except democratic forms of government.” In that article, Naess contrasted Carson’s position with the slogan of neo-Marxists and the Frankfurt School (from which the New Left positions of Marcuse and Bookchin grew) that “everything is political.”¹⁶³ And so, one of the key things that Naess is making clear in relation to the deep ecology movement’s “change everything” stance is that, contrary to the almost entirely political orientation of neo-Marxists, the ecological crisis calls into question questions Fundamental philosophical issues that need to be addressed, such as the anthropocentric orientation of Western culture and the intrinsic value of ecosystems and wild species. Moreover, the limited (or “superficial”) analysis of the crisis based on “urban pollution” elaborated by the New Left and the mainstream of environmentalism, is not able to reveal the extent to which more radical social changes are needed.

Naess continues to insist on the importance of “deep questioning” for the deep ecology movement. One important reason is his belief that the motivation for effective environmental activism stems from deep religious and philosophical principles. Activists need to reach out to them, and acknowledge them, through the process of ‘deep questioning’. The fundamental principles also provide the basis for a “total perspective.” Naess argues that, whether they know it or not, all people have a total perspective. Such a perspective provides the basis for each person’s “philosophy of life” and also for understanding the ecological “big picture”. Total perspectives can also be revealed through deep questioning.¹⁶⁴

In relation to Bender’s desire for a global stance, Naess’s personal stance, the “T Ecosophy,” stands as a kind of schema (or template) for a global deep ecology stance (which includes a social justice component).), but Naess does not want to impose it on others. He sincerely believes in a diversity of worldviews (akin to the best of postmodern thought) and, as Bender knows, Naess wants to attract as many religious and philosophical positions as possible to support the deep ecology movement. All of these considerations are important to understand why deep ecology should not be presented as a global stance, or a grand ‘global narrative’.

Bender, perhaps inadvertently, comes close to one of the main reasons for Naess’s shift to the 1984 program, when he argues that deep ecology is in danger of becoming an “*exclusively ecological* movement. ”. In a broad sense, this is what Naess proposes for

¹⁶² One mile=1,609 km. *N of the t.*

¹⁶³ “Tramelled” in the original. Here, the author is referring to the passage from the Wilderness Act, mentioned above, in which it is said that in protected wilderness areas, nature has no *obstacles* imposed by human beings. *N of the t.*

¹⁶⁴ Multinational chain of stores. *N. from t.*

the deep ecology movement. Given the aggressive anthropocentric and anti-ecological stances and tactics of Marxist-inspired social justice movements, I think Naess believes that at least one movement has to maintain an ecologically pure position. As documented throughout this article, social justice movements have been successful in many cases in hijacking the agenda of ecological/environmental movements. Unlike the left's agenda, which focuses exclusively on urban pollution and environmental social justice (and with an emphasis on race, class, and gender), Naess stresses that the main goal of the deep ecology movement is promoting *ecological sustainability* (as opposed to the concept of sustainable development), which for him means protecting "all the richness and diversity of life forms on the planet. To aspire to less," he says, "is contrary to human dignity."

For Naess, the deep ecology movement, the peace movement, and the social justice movements should be seen as separate social movements (with different goals and intellectual histories), but they can, and should, join forces (to help "change everything") under the general name of the Green movement. In support of this position, he says that "considering the accelerating rate of irreversible ecological destruction throughout the world, I find it acceptable to continue fighting for ecological sustainability whatever the state of affairs regarding the other two objectives of the Green societies [peace and social justice]". Proponents of the deep ecology movement, he says, "should focus on specific issues related to the *ecological* crisis (including its social and political consequences)."¹⁶⁵ More recently, Naess has noted that "the interdependence [of the three movements] does not eliminate their differences: we cannot be activists in all of them. We must choose. Support them all, but work mainly on one."¹⁶⁶ I think that Naess's strategy to keep the deep ecology movement focused specifically on the ecological crisis, as we understand it through the global ecological scientific consensus, is correct.

Deep Ecology as an activist philosophical movement

This leads to concerns from the editors of *Beneath the Surface* (David Rothenberg, Andrew Light, and Eric Katz) that "Naess, though a philosopher, has often insisted that he is more interested in deep ecology as a political and social *movement* than as a philosophy". These editors are more interested in critiques of deep ecology "philosophy" than in the "specific political issues" addressed by the deep ecology movement. But even here Rothenberg, since he collaborated closely with Naess for several years in Norway, could have helped to head off many of the misunderstandings that a large number of authors have made. They could also have done a more precise job of describing "the" philosophy of deep ecology in their introduction.¹⁶⁷

¹⁶⁵ *Mustela nigripes*. *N. from t.*

¹⁶⁶ Famous American motorhome brand. *N. from t.*

¹⁶⁷ The tragedy of the commons is the name commonly given to the situation in which a freely accessible common resource is individually exploited. The result, in the absence of an authority to effectively regulate such exploitation, is often over-exploitation and depletion of the resource, as each individual party tries to obtain maximum profit by intensifying exploitation. *N. from t.*

Michael Zimmerman has argued that the deep ecology movement has been identified with the utopian visions of the counterculture and the New Paradigm of the 1960s. Deep ecology, he says, is a form of utopianism, and thus all criticisms of utopianism made by postmodernists can be applied to it.¹⁶⁸ Devall and Sessions' book has a chapter on "ecotopia," which includes a discussion of the utopian ideas of Huxley, Callenbach, Shepard, and others, but begins with Paul Sears's comment on the possibility of understanding utopian thought as "a criticism of the defects and limitations of society and as a sign of the desire for something better."¹⁶⁹ Perhaps the bioregionalism of Gary Snyder and others, which is an important aspect of deep ecology activism, can be seen as a kind of utopianism. But by the time, in 1984, Naess had revised the position of deep ecology, it was becoming increasingly clear that society was not going to undergo any drastic change in its ecological course. Recently, Naess and other theorists in the deep ecology movement have become more pragmatic in trying to devise strategies to protect wild Nature and head off the worst of the ecological crisis. Some of Naess's key articles on these questions are "Politics and the Ecological Crisis" and "Deep Ecology for the 22nd Century," concerning the possibilities for Green societies in the future. But the most important emphasis is on "overcoming the growing ecological crisis".

From its beginnings with Aldo Leopold, Dave Brower, Rachel Carson, and Paul Ehrlich, the far-reaching deep ecology movement has been an activist ecophilosophical movement interested *mainly* in the search for humanitarian social and political solutions, but realistic, to the global ecological crisis. Conservation biology is a natural continuation of the ecological activism pioneered by Carson, Ehrlich, and others. Naess's efforts have been directed (in both his 1973 and 1984 formulations) to describing the deep ecology movement from its beginnings in the 1950s and 1960s, trying to develop a solid philosophical basis for the movement, and, along with other deep ecology theorists, criticizing various environmental strategies and proposing alternative strategies to deal with the ecological crisis. British environmental journalist Joanna Griffiths suggests that a revived deep ecology movement needs "a popular mantra for a more cynical and deranged age."¹⁷⁰

The future: a cyborg/New York techno-utopia or a wild land?

Traditional societies attribute identity based on ethnic and tribal traditions, modern societies based on the sovereignty of the State and the market economy. The postmodern world will discover that the true basis of our identity is our belonging to a species interconnected with all others—a foundation far more universal than race, gender, ethnicity, or any other partial and restricted characteristic.

¹⁶⁸ "Wilderness" in the original. *N. from t.*

¹⁶⁹ "The usual line of bullshit (pun intended)" in the original. This phrase in English plays with the double meaning of "bullshit" (literally "dung", although it is normally used with the meaning of "nonsense"), to make fun of what the rancher was saying, and explicitly points it out in the parentheses. These humorous details are impossible to translate. *N. from t.*

¹⁷⁰ God of ancient Asia Minor mythology, associated with rain and fertility. The author metaphorically refers to those who defend wild Nature. *N. from t.*

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In his critique of deep ecology, Bron Taylor approvingly cites Dan Deudney's claim that deep ecology should go beyond local bioregional concerns and support global solutions to the ecological crisis.¹⁷¹ Taylor seems to be very unfamiliar with Naess's writings and tends to look at deep ecology through the prism of the Earth First! movement. Since the 1980s, Naess has repeatedly emphasized that ecological problems are increasingly global in scope and must also be addressed from a global point of view: we have to "think and act globally, regionally and locally."¹⁷² Most global action must take place under the auspices of the United Nations. For example, Naess cites the Berne convention in relation to his assertion that "with increased education, combined with economic progress in the Third World, the goal is not only to stop the excessive rate of extinction of animals and plants but also to protect ecosystems as a whole and ensure the continuation of evolution [in other words, the protection of the wildness¹⁷³ of the Earth]."¹⁷⁴

The initial position of the United Nations on the environment was exemplary. In 1982, the General Assembly adopted the ecocentric World Charter for Nature which declared that all life has intrinsic value and that "nature shall be respected and its essential processes shall not be disturbed". Unfortunately, former UN official Sadruddin Aga Khan paints a bleak picture of the recent United Nations approach to environmental protection. The already flawed concept of ecological sustainability has been degraded into exploitative concepts such as "sustainable use" and "sustainable consumption". The United Nations, he says, has increasingly allied itself with multinational corporations, to the detriment of both the environment and the poor, and has become little more than an agency serving the global economy.¹⁷⁵

At this point in history, it is entirely reasonable to believe that humanity is at an absolutely crucial and unprecedented crossroads. In his 1992 bestseller, *Earth in the Balance*, Al Gore proposed the only sensible course when he said that concern for protecting the environment and solving the ecological crisis should become "the central organizing principle of civilization." "¹⁷⁶ Gore expounded on global ecological scientific concerns: overpopulation and species extinction. He spent many pages analyzing the dysfunctional consumer-addicted American way of life, and also warned of the danger of relying exclusively on technological fixes.

¹⁷¹ In reference to the idea that private property is a natural right of the human being defended by this 17th century philosopher, considered one of the fathers of liberalism. *N. from t.*

¹⁷² North American Free Trade Agreement. *N. from t.*

¹⁷³ "Wildness" in the original. *N. of the trad.*

¹⁷⁴ Translation by Último Reducto of "Wilderness-Now More than Ever" according to the reprint published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article in *WildEarth* magazine 4, no. 4 (Winter 1994/1995):60-63. © 1994 Reed F Noss. *N. from t.*

¹⁷⁵ "Wildness" in the original. *N. from t.*

¹⁷⁶ "Wilderness areas" in the original. *N. from t.*

As a result of the recent furor over global warming, “peak oil” and Gore’s global warming video *An Inconvenient Truth*¹⁷⁷, the latest issue of the magazine *Newsweek* heralds with great fanfare “America’s new greening”. There is mainly talk of hybrid cars and alternative energy sources.¹⁷⁸ The May 2006 issue of *Wired* magazine has a photograph of Gore on the cover with the caption “the pro-growth, pro-tech fight to curb global warming,” and “Al Gore and the rise of neogreens”. However, “the neo- greens” are “eco-capitalists”, typical defenders of the hybrid car, solar panels, etc., who find their personal identity by leading an “eco-chic” way of life and wearing eco-designer clothes. Is the “new greening of America” and the world going to be just another in the long list of superficial cosmetic answers or will it finally be an awareness of the need for profound change? As part of his strategy, Niles Eldredge says that we need to use the media. Obviously, a tremendous effort is required to educate the world in a comprehensive understanding of the ecological crisis.

And some people are becoming aware of the true face of Teilhard/Haraway’s artificial techno-utopias. For example, lawyer and activist Andrew Kimbrell points to biotechnology’s attempt to “remake life in technology’s image”—a type of “technogenesis.” Two British academics, Lee-Anne Broadhead and Sean Howard, have made an impassioned call for a moratorium on nanotechnology and “nanobots” that could “feed” on greenhouse gases in the atmosphere. They are alarmed by the risk that “the end of the natural world is, unbelievably, the explicit and celebrated goal of most pro-nanotech literature and propaganda. But what if the end of the natural world turns out to be the death of all of us?”¹⁷⁹ Extending Bertrand Russell’s warning, perhaps the greatest folly of the contemporary world is not just “intoxication caused by power over Nature,” but the techno-utopian belief that we don’t need the wild ecosystems of the Earth to sustain life and that technologists have the ability to successfully replace such systems. An interesting question is whether Gore will maintain its green commitment to protecting the natural world, or whether it will shift to the techno-utopian mindset of *Wired*/Silicon Valley magazine. The public should be made fully aware of the issues involved in determining whether a realistic future for humanity is based on protecting a wild Earth or becoming cyborgs/techno-utopian. For the scientists of the global ecological scientific consensus, it is clear that the widely popular attempt to transform the Earth into an artificial cyborg techno-utopia will ultimately be the end point of both humanity’s and Earth’s destiny. As Paul Shepard prophetically warned in 1969, “the affirmation of its own organic essence will be the final test of the human mind.”¹⁸⁰

¹⁷⁷ There is a Spanish translation: *An Inconvenient Truth*, Paramount Classics, 2006. *N. from trans.*

¹⁷⁸ “National Biological Survey’s Gap Analysis” in original. It refers to an official project that later became carried out by the Biological Research Division of the US Geological Survey. *N. from t.*

¹⁷⁹ “Wild areas” in the original. *N. from t.*

¹⁸⁰ *Idem. N. of the t.*

GRADES

1. Mark Hertsgaard provides a devastating expose of the Republican political right's decades-long disinformation campaign against global warming (and the failure of the US media to combat it) in *Vanity Fair* (May) 2006; Jared Diamond, *Collapse* (New York: Viking, 2005).¹⁸¹

2. Donald Worster, "The Shaky Ground of Sustainability,"[liv] in George Sessions, *Deep Ecology for the 21st Century* (Boston: Shambhala, 1995) pp. 417-27; the I=PAT equation was first published in Paul Ehrlich and John Holdren, "Impact of Population Growth," *Science* (1971): 1212-17.

3. Bob Taylor, "John Dewey and Environmental Thought," *Environmental Ethics* 12 (1990): 175-84; An anthology exposing the neopragmatic position is Ben Minteer and Bob Taylor (eds.), *Democracy and the Claims of Nature* (Lanham Md.: Rowman and Littlefield, 2002).

4. See Michael Zimmerman, *Contesting Earth's Future: Radical Ecology and Postmodernity* (Berkeley: University of California Press, 1994) p. 93 and following.

5. David Nicholson-Lord "Blind Spot", *Resurgence* 237 (July/August, 2006): 21-22.

6. Frederick Buell, *From Apocalypse to Way of Life* (New York: Routledge, 2004).

7. Joseph DesJardins, *Environmental Ethics*, 2[a] ed. (Belmont, CA: Wadsworth, 1997), p. 215.

8. For a "crash course" in ecological literacy, I would recommend (1) Diamond's *Collapse* (especially chapter 16); (2) Buell's *From Apocalypse to Way of Life*; and (3) for the most complete and up-to-date explanation of the ecological crisis, along with the steps needed to prevent global catastrophe, Anne and Paul Ehrlich, *One With Nineveh: Politics, Consumption, and the Human Future* (Washington DC: Island Press, 2004).

9. An earlier version of this update process appears in my "Deep Ecology" section in Michael Zimmerman, JB Callicott, George Sessions, *et al.* (eds.), *Environmental Philosophy*, 3rd ed. (New Jersey: Prentice-Hall, 2001). As a result of his radical shift in philosophical stance (from a generally deep ecological orientation to a Ken Wilber/Donna Haraway/Cyborg Manifesto-type anthropocentric one) Zimmerman withdrew this section from the 4th edition.

10. Barbara Ehrenrich and Janet McIntosh, "The New Creationism: Biology under Attack," *The Nation*, June 9, 1997: 11-16.

11. Paul Shepard, "Ecology and Man —A Viewpoint," in Sessions, *Deep Ecology for the 21st Century*, PP-131-140. On the generally legitimate fears and concerns of the left and postmoderns about biology, see Andrew Ross, *The Chicago Gangster Theory of Life: Nature's Debt to Society* (New York: Verso, 1994), Chapter 5 ("Superbiology").

¹⁸¹ There is a Spanish translation: *Colapse. Why do some societies endure and others disappear*, Debate, Barcelona, 2006. *N. del trad.* [liv] There is a Spanish translation: "The fragility of sustainable development" in Donald Worster, *Earth Transformations*, Coscoroba|Latin American Center for Social Ecology, Montevideo, 2008 *N. from trans.*

12. Frederic Bender, *The Culture of Extinction: Toward a Philosophy of Deep Ecology* (Buffalo, NY: Humanity Books, 2003) pp. 78-101. For an excellent summary of his position, see Paul Shepard, *Coming Home to the Pleistocene* (Washington, DC: Island Press, 1998). Philosopher Mary Midgley agrees with Arne Naess that it is crucial to examine the role worldviews play in our attitudes toward Nature; see Kate Rawles, "Mary Midgley," *Revision* 229 (2005): 42-43.
13. Michael Zimmerman, *Contesting Earth's Future*, p. 91-92.
14. Bender, *The Culture of Extinction*, p. 255-61, 283-88; see also the excellent work of Graham Parkes, "Nietzsche's Environmental Philosophy," *Environmental Ethics* 27 (2005): 77-91.
15. Bill McCormick, "Sartre and Camus on Nature," *The Trumpeter* 13, 1 (1996): 17-20; David Orr coined the word "biophobia" as opposed to EO Wilson's concept of biophilia, see David Orr, *Earth in Mind: On Education, Environment and the Human Prospect* (Washington DC: Island Press, 1994) p. 131; see also David Orr, "Love It or Lose It," in Stephen Kellert and EO Wilson (eds.), *The Biophilia Hypothesis* (Washington DC: Island Press, 1995). Orr says that "Biophobia is not okay for the same reasons that misanthropy or sociopathy are not (...) is biophobia a kind of collective madness?"
16. Zimmerman, *Ibid.* p. 92, 116-117.
17. *Ibid.* pp. 93, 99.
18. Niles Eldredge, *Life in the Balance: Humanity and the Biodiversity Crisis* (New Jersey: Princeton University Press, 1998) pp. 155-56.
19. Bernard Williams, *Truth and Truthfulness* (Princeton, NJ: Princeton University Press, 2002); see also Lawrence Sklar, *Theory and Truth: Philosophical Critique within Foundational Science* (New York: Oxford University Press, 2000); Noretta Koertge (ed.), *A House Built on Sand: Exposing Postmodern Myths about Science* (New York: Oxford University Press, 1998).
20. Mick Smith, "To Speak of Trees: Social Constructivism, Environmental Values, and the Future of Deep Ecology," *Environmental Ethics* 21 (1999): 368-372; the writing in question is: George Sessions, "Postmodernism and Environmental Justice", *The Trumpeter* 12 (1995): 150-154; for a response to Smith, see Arne Naess, "Avalanches as Social Constructions," *Environmental Ethics* 22 (2000): 335-336.
21. Arne Naess, "Ecosophy and Gestalt Ontology," in George Sessions, *Deep Ecology for the 21st Century*, pp. 240-45.
22. The warnings from the world's scientists appear in Paul and Anne Ehrlich, *Betrayal of Science and Reason: How Anti-Environmental Rhetoric Threatens our Future* (Washington DC: Island Press, 1996) Appendices A and B (The Ehrlichs also criticize the ideas of Julian Simon and others in this book); see also Ehrlich and Ehrlich, *One With Nineveh*; the global scientific consensus is also reflected in the first half of Al Gore's book *Earth in the Balance* [iv] (New York: Houghton Mifflin, 1992); for a deep ecology assessment of Gore, see Harold Glasser, "Naess's Deep Ecology Approach and Environmental Policy," *Inquiry* (Oslo) 39 (1996): 157-87; For an explanation of recent

trends in continuing global ecological destruction, see Lester Brown, *Eco-economy: Building an Economy for the Earth* (New York: Norton, 2001).

23. Bender, *The Culture of Extinction*, p. 17-27, 29-68; Franz Broschimmer, *Ecocide: A Short History of the Mass Extinction of Species* (London: Pluto Press, 2002) [lvi].

24. Arne Naess, "Deep Ecology for the 22nd Century," in Sessions, *Deep Ecology for the 21st Century*, pp. 463-67.

25. Gregg Easterbrook, *A Moment on the Earth: The Coming Age of Environmental Optimism* (New York: Viking, 1995); for comments on Easterbrook, see George Sessions, "Political Correctness, Ecological Realities, and the Future of the Ecology Movement," *The Trumpeter* 12 (1995): 191-196.

26. Bjorn Lomborg, *The Skeptical Environmentalist*[lvii] (New York: Cambridge University Press, 2001); see also Nicholas Wade, "From an Unlikely Quarter, Eco - Optimism," *New York Times*, August 7, 2001, D1-D2; Bjorn Lomborg, "The Environmentalists Are Wrong," *New York Times*, August 26, 2002; for a discussion on the report of the Danish Committee against Scientific Fraud,

[lv] There is a Spanish translation: *The Earth at stake. Ecology and human consciousness*, Emecé, 1992. *N. from trans.*

[lvi] There is a Spanish translation: *Ecocide. Brief history of the mass extinction of species*, Laetoli, 2005. *N. del trad.*

[lvii] There is a Spanish translation: *The skeptical ecologist*, Espasa Calpe, 2003. *N. for trans.* see Mark Lynas, "Natural Bjorn Killer," *The Ecologist* 33 (2003): 26-29; Anne and Paul Ehrlich, *One With Nineveh*, pp. 253-54.

27. For the Roderick French quote and a discussion of anthropocentrism in the humanities, see George Sessions, *Deep Ecology for the 21st Century*, pp. 97-99.

28. For an excellent survey of the history of religion and ecology in the West, see chapter 4 "The Greening of Religion", in Roderick Nash, *The Rights of Nature: A History of Environmental Ethics* (Madison: University of Wisconsin Press, 1989). Much less satisfactory, however, is Nash's discussion of "The Greening of Philosophy." For a rare survey of the beginnings of contemporary ecotheology with Thomas Berry and Mary Tucker, see Jim Motavalli, "Stewards of the Earth," *E: The Environmental Magazine* 13 (2002): 1-16; for Berry's sweeping 1987 article, "The Viable Human," see Sessions, *Deep Ecology for the 21st Century*, pp. 8-18.

29. Motavalli, "Stewards of the Earth": 3.

30. See, for example, Fabien Ouaki, *Imagine All the People: A Conversation with the Dalai Lama* (Boston: Wisdom Publications, 1999); see also the Dalai Lama's speech in Allan Badiner, *Dharma Gaia* (Berkeley, Parallax Press, 1990); Sulak Sivraksa, "A Cloud in a Piece of Paper," *Resurgence* 215 (2002): 23-24; Leonardo Boff, "Liberation Theology," *Resurgence* 215 (2002): 22.

31. Berry, "The New Political Realignment," cited in Sessions, *Deep Ecology for the 21st Century*, pp. xx; for the Michael Lerner quote, see Jordi Pigem, "The Greening of Religions", *Resurgence* 229 (2005): 53.

32. Glenn Scherer, "Religious Wrong," in *The Environmental Magazine* 14 (2003): 2-6; Bill Moyers, "On Receiving Harvard Medical School's Global Environment Citizen Award," December 1, 2004 (published at [<http://www.CommonDreams.org>][www.CommonDreams.org]).

33. Jack Turner, *The Abstract Wild* (Tucson, University of Arizona Press, 1996) p. xvi.

34. Ramachandra Guha, "Radical American Environmentalism and Wilderness Preservation: A Third World Critique,"[lviii] *Environmental Ethics* 11 (1989): 71-83.

35. See Arne Naess, *Gandhi and the Nuclear Age* (New Jersey: Bedminster Press, 1965); Arne Naess, *Gandhi and Group Conflict* (Oslo: Universitetsforlaget, 1974); for criticism of Guha, see Arne Naess, "The Third World, Wilderness, and Deep Ecology," in Sessions, *Deep Ecology for the 21st Century*, pp. 397-407; Arne Naess, "Comments on Guha", in Nina Witosek and Andrew Brennen (eds.), *Dialogues: Arne Naess and the Progress of Ecophilosophy* (Lanham, MD: Rowman and Littlefield, 1999) pp. 325-33. Typical of the "new generation," anthropocentric ecophilosopher Deane Curtin, in his book *Chinnagounder's Challenge* (Indianapolis: University of Indiana Press, 1999), basically agrees with, and extends, Guha's position. . He agrees with Guha that the anthropocentric/ecocentric distinction is largely false and that Muir and Leopold's concerns are not relevant to Third World countries. Curtin suggests that the "first generation" of ecophilosophers, such as J. Baird Callicott and many proponents of deep ecology, are misanthropic and attribute extreme perspectives like those of Garrett Hardin to them. Taken together, Curtin criticizes them for placing ecological priorities above concerns for social justice. Curtis tends to clear Arne Naess of many of these accusations while, at the same time, misunderstanding much of his ecological approach. For example, Curtin is correct that Naess is a pluralist when he talks about cultural diversity, but Naess also makes it clear that all cultures have a responsibility to protect their wild species and ecosystems. Again, following Guha, Curtin *seems* to propose an "ecological" agricultural model for the United States along the lines of that proposed by Thomas Jefferson. Curtin mentions the species extinction crisis and the loss of the wild but doesn't seem to be very concerned about it. The most flagrant omission, however, is its failure to explain why an agricultural model is preferable to the greener bioregional ideas of Naess and Gary.

[lviii] There is a Spanish translation: "American environmentalism and the preservation of nature: a third-world critique" in *Political Ecology* n°14 (1997), pages 33-46. *N. from trans.*

Snyder that leave room for agricultural and urban life but emphasize the high priority of protecting what remains of the wild and biodiversity *worldwide*.

36. It turns out that Guha, prior to writing his paper, was involved for a decade in an anthropocentric version of "social ecology" in India that treats Nature as "human resources" (much like Pinchot's pre-Australian stance). ecological conservation of resources) and rejects conservation biology: see Sahotra Sarkar, "Restoring Wilderness or Reclaiming Forests?" in David Rothenberg and Martha Ulvaeus (eds.), *The World and the Wild* (Tucson: University of Arizona Press, 2001) pp. 37-55; for another critique of

Guha and Cronon, see Philip Cafaro, "For a Grounded Conception of Wilderness and More Wilderness on the Ground," *Ethics and the Environment* 6 (2001): 1-17; Vandana Shiva's comments on deep ecology are found in the video "The Call of the Mountain", (1997) Amsterdam: ReRun Products.

37. J. Baird Callicott, "The Wilderness Idea Revisited: The Sustainable Development Alternative," *The Environmental Professional* 13 (1991): 225-47.

38. J. Baird Callicott and Michael Nelson (eds.), *The Great New Wilderness Debate* (Athens: University of Georgia Press, 1998), p. twenty; J. Baird Callicott, "A Critique of and an Alternative to the Wilderness Idea", Reed F. Noss, "Wilderness —Now More than Ever", Dave Foreman, "Wilderness Areas are Vital", *Wild Earth* 4 (1994-5): 54-68.

39. Edward Grumbine, "Wildness, Wise Use, and Sustainable Development," in Sessions, *Deep Ecology for the 21st Century*, pp. 376-96.

40. See Donald Worster, "The Shaky Ground of Sustainability", Wolfgang Sachs, "Global Ecology and the Shadow of Development", Arne Naess, "Politics and the Ecological Crisis", all in Sessions, *Deep Ecology for the 21st Century*, p. 417-53; Buell, *From Apocalypse to Way of Life*, pp. 71, 189 et seq.; for Naess's proposal, see Sessions, *Deep Ecology for the 21st Century*, pp. 323-5.

41. William Cronon, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature", in William Cronon (ed.), *Uncommon Ground: Rethinking the Human Place In Nature* (New York: WW Norton, 1995) pp. 69-90.

42. Donald Worster, "Seeing Beyond Culture," *Journal of American History* 76 (1990): 1142-47.

43. Donald Waller, "Wilderness Redux: Can Biodiversity Play a Role?" *Wild Earth* 6 (1996-7): 36-45; see also Holmes Rolston, "Nature for Real: Is Nature a Social Construct," in TD Chappell (ed.), *The Philosophy of the Environment* (Edinburgh: University of Edinburgh Press, 1997) pp. 38-64.

44. David W. Kidner, "Fabricating Nature: A Critique of the Social Construction of Nature," *Environmental Ethics* 22 (2000): 339-57; David Kidner, *Nature and Psyche: Radical Environmentalism and the Politics of Subjectivity* (New York: SUNY Press, 2000); Other excellent critiques of Cronon's social constructivism include: Anna Peterson, "Environmental Ethics and the Social Construction of Nature," *Environmental Ethics* 21 (1999): 339-57; Eileen Crist, "Against the Social Construction of Nature and Wilderness," *Environmental Ethics* 26 (2004): 5-24; David Kidner, "Industrialism and the Fragmentation of Temporary Structure," *Environmental Ethics* 26 (2004): 135-153.

45. Donald Worster, "The Shaky Ground of Sustainability", *op. cit.*; for another critique of Botkin's ecology, see Stan Rowe, "A New Ecology?" *The Trumpeter* 12 (1995): 197-200.

46. The papers of the participants are published in Cronon, *Uncommon Ground*; For a discussion of the University of California, Irvine conference and those papers, as well as the "Reinventing Nature" conferences held at the University of California, Santa Cruz and the University of California, Davis, see George Sessions, "Reinventing

Nature?': The End of Wilderness," *Wild Earth* 6 (1996-97): 46-52; Niles Eldredge, *Life in the Balance: Humanity and the Biodiversity Crisis* (New Jersey: Princeton University Press, 1998) p. 151.

47. Gary Snyder, "The Rediscovery of Turtle Island," in Sessions, *Deep Ecology for the 21st Century*, pp. 454-62.

48. Gary Snyder, "Is Nature Real?", in Tom Butler (ed.), *Wild Earth* (Minnesota: Milkweed Editions, 2002) pp. 195-98; Donald Worster also joins the debate in "The Wilderness of History," in Butler, *Wild Earth*, pp. 221-28.

49. David W. Orr, "The Not-So-Great Wilderness Debate...Continued," *Wild Earth* 9 (1999): 74-80; Peter Coates, *Nature* (Berkeley: University of California Press, 1998) p. 185.

50. Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington DC: Island Press, 1993) especially chapters 1 and 3, as well as the conclusion; Mark Dowie, *Losing Ground: American Environmentalism at the Close of the Twentieth Century* (Boston: MIT Press, 1995) p. twenty-one; Gottlieb's "environmentalism" orientation toward primarily urban industrial pollution is well illustrated in his *Environmentalism Unbound* (Boston: MIT Press, 2002).

51. Dowie, *Ibid.*, 2-3, 30, 126-7; for a critique of Gottlieb and Dowie, see George Sessions, "Political Correctness, Ecological Realities, and the Future of the Ecology Movement," *op. cit.*

52. Michael Cohen, *The History of the Sierra Club: 1892-1970* (San Francisco: Sierra Club Books, 1988); Stephan Fox, *John Muir and His Legacy: The American Conservation Movement* (Boston: Little, Brown, 1981); Carolyn Merchant, "Shades of Darkness: Race and Environmental History," *Environmental History* 8 (2003): 380-94.

53. Gary Snyder, *The Practice of the Wild* (San Francisco: North Point Press, 1990) pp. 180-81. 554. Murray Bookchin, "Social Ecology versus Deep Ecology," republished in Witoszek and Brennen, *Philosophical Dialogues*, pp. 281-301.

55. Charlene Spretnak and Fritjof Capra, *Green Politics: The Global Promise* (New York: Dutton, 1984).

56. Kirkpatrick Sale, "Deep Ecology and Its Critics," *The Nation* 22 (May 14, 1988): 670-75, republished in Witoszek and Brennen, *Philosophical Dialogues*, pp. 213-226; see also Arne Naess's letters to Foreman and Bookchin, and reply to Bookchin, in Witoszek and Brennen, pp. 222-31, 302-309. For an analysis of the takeover of the American Greens and Earth First! for the New Left/social ecology, see George Sessions, "Radical Environmentalism in the 90's" and "Postscript: March 1992", *Wild Earth* 2 (1992): 64-70.

57. Alston Chase, "The Great, Green Deep Ecology Revolution," *Rolling Stone* 498 (April, 1987): 61-64, 162-68. As a "right-wing guy" (and no fan of deep ecology), it's no surprise that most of Chase's article focuses on the New Left's attempt to seize power over Green politics and environmentalism.

58. Bender, *The Culture of Extinction*, p. 355; for ecofeminism, see Ariel Sallef, "Class, Race, and Gender Discourse in the Ecofeminism/Deep Ecology Debate," in Witoszek and Brennen, *Philosophical Dialogues*, pp. 236-54.

59. Robyn Eckersley, *Environmental and Political Theory: Toward an Ecocentric Approach* (New York: SUNY Press, 1992) pp. 25, 29; for critiques of Marx from an ecological perspective, see John Clark, "Marx's Inorganic Body," *Environmental Ethics* 11 (1989): 243-58; Val Routley (Plumwood), "On Karl Marx as an Environmental Hero," *Environmental Ethics* 3 (1981): 237-44.

60. Gottlieb, *Forcing the Spring*, p. 88. 1976. *N. from trans.*

61. David Ehrenfeld, *The Arrogance of Humanism* (New York: Oxford University Press, 1978) pp. 54, 127. Murray Bookchin, *Post-Scarcity Anarchism*[lix] (Berkeley, CA: Ramparts, 1971); Fred Buell, *From Apocalypse to Way of Life*, pp. 218-19.

62. Peter Borrelli, "The Ecophilosophers," *Amicus Journal* 10 (1988): 30-39; Chris Lewis and Commoner are discussed in Sessions, *Deep Ecology for the 21st Century*, pp. 98-99; Paul Ehrlich has been maligned by both the left and the right, but to better understand his decisive role in the development of twentieth-century ecological thought and global scientific consensus, see the 1996 PBS video, *Paul Ehrlich and the Population Bomb*.

[lix] There is a Spanish translation: *Anarchism in the consumer society*, Kairós,

63. Robyn Eckersley, "Divining Evolution: The Ecological Ethics of Murray Bookchin," *Environmental Ethics* 11 (1989): 99-116; see also Eckersley, *Environmentalism and Political Theory*, pp. 147-67; Similar criticisms of Bookchin are found in Andrew McLaughlin, *Regarding Nature: Industrialism and Deep Ecology* (New York: SUNY Press, 1993) pp. 215-17; George Sessions, "Deep Ecology and the New Age Movement," in Sessions, *Deep Ecology for the 21st Century*, pp. 303-304.

64. John Passmore, *Man's Responsibility for Nature* (New York: Scribner's, 1974) chapters 1 and 2. Passmore's ideas are summarized in Sessions, "Deep Ecology and the New Age": 298-99 .

65. Bender, *The Culture of Extinction*, p. 365-66.

66. Berry is quoted in Sessions, "Deep Ecology and the New Age," p. 305.

67. Bender, *Ibid*, p. 355.

68. Warwick Fox, "The Deep Ecology-Ecofeminism Debate and Its Parallels," in Sessions *Deep Ecology for the 21st Century*, pp. 269-89.

69. John Clark, "A Social Ecology," in Michael Zimmerman *et al.* (eds.), *Environmental Philosophy* 2[th] ed. (New Jersey: Prentice Hall, 1998) pp. 421, 430; Michael Zimmerman, "Ken Wilber's Critique of Ecological Spirituality," in David Barnhill and Roger Gottlieb (eds.), *Deep Ecology and World Religions* (New York: SUNY Press, 2001), pp. 243-69.

70. John Clark, "The Matter of Freedom: Ecofeminist Lessons for Social Ecology," in Michael Zimmerman *et al.* *Environmental Philosophy* 3rd Edition (New Jersey: Prentice Hall, 2001) pp. 455-70.

71. John Clark, "How Wide is Deep Ecology?" in Eric Katz, Andrew Light, and David Rothenberg (eds.), *Beneath the Surface: Critical Essays in the Philosophy of Deep Ecology* (Cambridge: MIT Press, 2000), pp. 710.
72. For Naess's views on immigration, see Arne Naess, "Politics and the Ecological Crisis," in Sessions, *Deep Ecology for the 21st Century*, pp. 451-52; Norman Myers, "The Most Overpopulated Country," *Population Press*, April/May, 2002; Diamond, *Collapse*, chapter 16; Ehrlich and Ehrlich, *One With Nineveh*, pp. 106-11.
73. Peter Dwyer, "The Invention of Nature," in Roy Ellen and Katsuyoshi Fukui (eds.), *Redefining Nature: Ecology, Culture, and Domestication* (Oxford: Berg, 1996) pp. 157-86.
74. Paul Shepard, "Virtually Hunting Reality in the Forests of Simulacra," in Michael Soule and Gary Lease (eds.), *Reinventing Nature? Responses to Postmodern Deconstructionism* (Washington DC: Island Press, 1995) pp. 17-29.
75. Ariel Salleh, "Deeper than Deep Ecology: The Eco-Feminist Connection," *Environmental Ethics* 6 (1984): 339-45.
76. Patsy Hallen, "The Ecofeminist-Deep Ecology Dialogue," in Witozek and Brennen, *Philosophical Dialogues*, pp. 274-80.
77. Ariel Salleh, "In Defense of Deep Ecology: An Ecofeminist Response to a Liberal Critique," in Katz *et al.*, *Beneath the Surface*, pp. 107-24.
78. Jack Turner, *Teewinot* (New York: St. Martin's Press, 2000) p. 110; William Barrett, *The Illusion of Technique: A Search for Meaning in a Technological Civilization* (Garden City, NY: Anchor Books, 1979) pp. 365-66, 373; Arne Naess, "The Shallow and the Deep, Long Range Ecology Movements", in Sessions, *Deep Ecology for the 21st Century*, pp. 151-55.
79. Jim Cheney, "Postmodern Environmental Ethics: Ethics as Bioregional Narrative," *Environmental Ethics* 11 (1989): 117-34; Jim Cheney, "The Neo-Stoicism of Radical Environmentalism" *Environmental Ethics* 11 (1989): 293-325; William Stephens, "Stoic Naturalism, Rationalism, and Ecology," *Environmental Ethics* 16 (1994): 275-86; for a further discussion and critique of Cheney's position, see Zimmerman, *Contesting Earth's Future*, pp. 284-89, 298-313.
80. Karen Warren, "Ecofeminist Philosophy and Deep Ecology," in Witozek and Brennen, *Philosophical Dialogues*, pp. 255-69.
81. Arne Naess, "The Ecofeminism versus Deep Ecology Debate," in Witozek and Brennen, pp. 273.
82. Bender, *The Culture of Extinction*, p. 379-382.
83. For (Routley) Sylvan's position, see William Grey, "A Critique of Deep Green Theory", in Katz *et al.*, *Beneath the Surface*, pp. 43-58.
84. Val Plumwood, "Nature, Self, and Gender: Feminism, Environmental Philosophy, and the Critique of Rationalism," in Zimmerman, *et al.* *Environmental Philosophy*, p. 286; Bender, *The Culture of Extinction*, pp. 383-387; see John Rodman, "Four Forms of

Ecological Consciousness Reconsidered,” in Sessions, *Deep Ecology for the 21st Century*, 121-30.

85. Bender, *The Culture of Extinction*, p. 441.

86. Plumwood, *Ibid.*, p. 299-300; Warren, “Ecofeminist Philosophy and Deep Ecology,” 259-60.

87. “Relational Holism: Huayan Buddhism and Deep Ecology” by David Barnhill, in Barnhill and Gottlieb, *Deep Ecology and World Religions*, pp. 77-106, is a well-developed critique of Plumwood’s analysis, which also includes a critique of Deane Curtin; see also David Loy, “Loving the World as Our Own Body: The Nondualist Ethics of Taoism, Buddhism and Deep Ecology,” *World Views: Environment, Culture, Religion* 1 (1997): 249-73; see also David Loy, *A Buddhist History of the West* (New York: SUNY Press, 2001).

88. Bender, *The Culture of Extinction*, p. 418, 445.

89. Arne Naess, “Self-Realization: An Ecological Approach to Being in the World,” in Sessions, *Deep Ecology for the 21st Century*, pp. 225-39. This article was published in *The Trumpeter* and can be read on the Internet in the archives for volume 4, no. 3, 1987.

90. Bender, *Ibid.*, p. 386, 399-415.17; A debate took place several years ago in which the young ecophilosopher Peter Reed took the existentialist position—as opposed to Naess’s idea of mutually interdependent Self-Realization for all beings—that humans and Nature are totally separate. Following the existentialism of the Norwegian Peter Zapffe, Reed maintained that we should respect and venerate Nature on the basis of its total “otherness”. In his reply to Reed, Naess provided an illuminating discussion of what he means by “identifying” with the self-realization of other beings (with their *conatus*[lx], in Spinoza’s words). Contrary to what existentialists claim, there is no “separate man.” Although there is a *similarity* between all beings to achieve self-realization (with which we can identify) there are still enormous *differences* and in any case their *alterity* remains. em>, and these differences are respected. Plumwood participated in this debate, rejecting the positions of both Reed and Naess, and conflating Naess’s notions of “identification” and “identity.” Again, Plumwood argued that the feminist concept of the “relational self” is the only acceptable approach. (Peter Reed, “Man Apart’ An Alternative to the Self-Realization Approach”; Arne Naess, “Man Apart’ and Deep Ecology: A Reply to Reed”; Val Plumwood, “Self-Relization or Man Apart?: The Reed-Naess Debate”, all of them in Witozek and Brennen, *Philosophical Dialogues*, pp. 181-210).

91. Bender, *Ibid.*, p. 383.

92. Fox, “The Deep Ecology-Ecofeminist Debate”; Hallen, “The Ecofeminism-Deep Ecology Dialogue”, pp. 277, 279; see also Patsy Hallen, “Making Peace with Nature: Why Ecology Needs Ecofeminism,” *The Trumpeter* 4 (1987): 3-14.

93. Warren, *Ecofeminist Philosophy*, p. 82-3, 149-73.

94. Warren, “Ecofeminist Philosophy and Deep Ecology”: 259, 263-67.

[lx] “*Conatus*” or “conatus” refers to a philosophical concept used in the past to refer to an inherent inclination or tendency of matter or mind to continue existing and developing. With him they tried to explain phenomena such as life or movement. Today it is considered a scientifically obsolete concept. *N. from trans.*

95. *Ibid.*, 260-62.

96. Warwick Fox, *Toward a Transpersonal Ecology* (Boston: Shambhala, 1990).

97. See Andrew McLaughlin, “The Heart of Deep Ecology”; and my introduction (pp. 6-7) in Sessions, *Deep Ecology for the 21st Century*; Sessions, “Deep Ecology,” in Zimmerman, *Environmental Philosophy* 2[a] ed. (1998): 172-173 (of which Warren is a co-editor!).

98. Charlene Spretnak, “Ecofeminism: Our Roots and Flowering,” in Irene Diamond and Gloria Orenstein, eds., *Reweaving the World: The Emergence of Ecofeminism* (San Francisco: Sierra Club Books, 1990). For Spretnak’s critique of postmodernism, see Charlene Spretnak, *The Resurgence of the Real* (Reading: Addison-Wesley, 1997).

99. For an analysis of Santayana’s discourse, “The Genteel Tradition in American Philosophy,” see George Sessions, “Ecocentrism and the Anthropocentric Detour,” in Sessions, *Deep Ecology for the 21st Century*, pp. 166-67.

100. Bertrand Russell, *A History of Western Philosophy* (New York: Simon and Schuster, 1945) pp. 494, 788-89, 827-28; Kenneth Blackwell, *The Spinozistic Ethics of Bertrand Russell* (London: Allen and Unwin, 1985).

101. For a discussion of Zamyatin, Orwell, and Huxley, see Wayland Drew, “Killing Wilderness,” and Del Ivan Janik, “Environmental Consciousness in Modern Literature,” both in Sessions, *Deep Ecology for the 21st Century*, p. 104-20.

102. Zimmerman, *Contesting Earth’s Future*, p. 359.

103. The Teilhardian quote is found in George Sessions, “Deep Ecology and the New Age,” in Sessions, *Deep Ecology for the 21st Century*, pp. 290-310, which is a comprehensive critique of the New Age movement’s anti-ecological and techno-utopian thinking; for ecological critiques of Haraway, see Bill McCormick, “The Island of Dr. Haraway,” *Environmental Ethics* 22 (2000): 409-18; Bill McCormick, “An Ecology of Bad Ideas,” *Wild Earth* 12 (2002): 70-72.

104. Buell, *From Apocalypse to Way of Life*, p. 211-46.

105. See Ned Hettinger’s review of Keekok Lee, *The Natural and the Artefactual* (Lanham Md.: Lexington Books, 1999) *Environmental Ethics* 23 (2001): 437- 40; Bill Joy, “Why the Future Doesn’t Need Us,” [lxi] *Wired* (April 2000): 238-246; see also Buell, *Ibid.*, pp. 153-54; Sadruddin Aga Khan, “Keeping to Our World,” *Resurgence* 215 (2002): 20-21.

106. Peter van Wyck, *Primitives in the Wilderness: Deep Ecology and the Missing Subject* (Albany: SUNY Press, 1997) pp. 103-35.

107. For Zimmerman’s initial interpretation of Heidegger, see his 1976 article “Technological Culture and the End of Philosophy,” widely cited in Sessions, “Spinoza and Jeffers on Man in Nature,” *Inquiry* 20 (1977): 487-89; for his rejection of Heidegger,

see Michael Zimmerman, "Rethinking the Heidegger-Deep Ecology Relationship," *Environmental Ethics* 15 (1993): 195-224.

108. Zimmerman, *Contesting Earth's Future*, p. 353. Teilhard's phrase is found in Sessions, "New Age and Deep Ecology": p. 293. For a more in-depth analysis of Ken Wilber's work, see Gus DiZerega's article "A Critique of Ken Wilber's Account of Deep Ecology and Nature Religions" in *The Trumpeter* volume 13, n° 2, nineteen ninety six.

109. See Gary Nabham and Stephen Trimble, *The Geography of Hope: Why Children Need Wild Places* (Boston: Beacon Press, 1994). Peter Kahn and Stephen Kellert (eds.) *Children and Nature* (Boston: MIT Press, 2002).

[ixi] There is a Spanish translation: "Why the future doesn't need us" in Glenn Yeffeth (ed.), *Take the red pill: science, philosophy and religion in the Matrix*, Obelisk, 2005. < em>N. of the trad.

110. Jerry Mander, *In the Absence of the Sacred: The Failure of Technology and the Survival of the Indian Nations*[lxii] (San Francisco: Sierra Club Books, 1991) pp. 85-6; for the corporate colonization of youth, see the PBS video *Affluenza* and the Frontline video *The Merchants of Cool*.

111. Chris Cuomo, "Review of Noel Sturgeon, *Ecofeminist Natures*," *Environmental Ethics* 21 (1999): 431.

112. Ned Hettinger and Bill Throop, "Refocusing Ecocentrism: Deemphasizing Stability and Defending Wildness," *Environmental Ethics* 21 (1999): 3-21.

113. Jack Turner, *The Abstract Wild* (Tucson: University of Arizona Press, 1996).

114. Gary Snyder, *The Practice of the Wild* (San Francisco: North Point Press, 1990).

115. Turner, *The Abstract Wild*, p. 82, 108.

116. *Ibid.*, p. 81, 84, 107-111.

117. *Ibid.*, p. xiv, 82.

118. *Ibid.*, p. xvi, 91-92. Turner's interpretation of Thoreau should be contrasted with that of the ecologist Daniel Botkin. Botkin says that Thoreau would have consented to the almost complete humanization of the Earth, as long as there were some swamps left near towns and cities where he could experience wild Nature. Thoreau would have liked Central Park in Manhattan. It is clear that Botkin does not have the slightest idea what Thoreau meant by "in the wild is the preservation of the world." Botkin has the honor to provide, in his book, the most distorted account of deep ecology today. He claims to position himself somewhere between the "wise use movement" and the deep ecology movement, but Snyder is correct in describing Botkin and Cronon as "the pinnacle of the 'wise use movement'". [Daniel Botkin, *No Man's Garden: Thoreau and a New Vision for Civilization and Nature* (Washington, DC: Island Press, 2001)].

119. Charles Mann, "1492" *Atlantic Monthly* (March 2002): 41-53.

120. Bill McKibben, *The End of Nature* (New York: Anchor Books, 1989)[lxiii]; Steven Vogel, "Environmental Philosophy After the End of Nature," *Environmental Ethics* 24 (2002): 21-39.

121. Karl Popper, *Objective Knowledge: An Evolutionary Approach* (London: Oxford University Press, 1972).
122. Hettinger and Throop, "Refocusing Ecocentrism," 17-18.
123. *Ibid.*, p. 18.
124. Turner, *The Abstract Wild*, p. 108-125; for discussions of conservation biology and the Wildlands Project, see Reed Noss and Allen Cooperridgere, *Saving Nature's Legacy: Protecting and Restoring Biodiversity* (Washington, DC: Island Press, 1994); Edward Grumbine (ed.) *Environmental Policy and Biodiversity* (Washington, DC: Island Press, 1994); Dave Foreman, *Rewilding North America* (Washington, DC: Island Press, 2004).
125. Jack Turner, "The Wild and Its New Enemies," in Ted Kerasote (ed.) *Return of the Wild: The Future of our Natural Lands* (New York: Pew Wilderness Center, 2001).
126. EO Wilson, *The Future of Life* (New York: Knopf, 2002) pp. 154-71; Paul Ehrlich, *Extinction: The Causes and Consequences of the Disappearance of Species* (New York: Random House, 1981); for studies of the inadequacy of "hot spots", see Ehrlich and Ehrlich, *One With Nineveh*, pp. 52-3.
127. Fred Pearce, "Review of EO Wilson, *The Future of Life*", *The Ecologist* 32 (2002): 40; for social/ecological critiques of multinational capitalism's globalization plans, see Richard Barnet and John Cavanaugh, *Global Dreams: Imperial Corporations and the New World Order* (New York: Simon and Schuster, 1994); David Korten, *When Corporations Rule the World* (Bloomfield, CT: Kumarian Press, 1995); see also "A Better World Is Possible!: Alternatives to Economic Globalization", a report of the International Forum on Globalization (2002) available at [<http://www.ifg.org>][www.ifg.org].
128. Arne Naess, "Ecosophy, Population, and Free Nature," *The Trumpeter* 5 (1988).
129. Arne Naess, "The Third World, Wilderness and Deep Ecology", in Sessions, *Deep Ecology for the 21st Century*, pp. 397-407.
130. Niles Eldredge, *Life in the Balance*, p. 157-165, 183-191.
131. Donald Worster, "The Shaky Ground of Sustainability," in Sessions, *Deep Ecology for the 21st Century*, p. 425; Worster discusses the controversy over whether the North American continent was "totally dominated" by indigenous peoples in "The Wilderness of History," in Butler, *Wild Earth*, pp. 221-29; see also his critique of Luc Ferry's *The New Ecological Order*[lxiv] in Donald Worster's "The Rights of Nature: Has Deep Ecology Gone Too Far?" *Foreign Affairs* 74 (1995): 1111-15.
132. Arne Naess, "The Shallow and the Deep, Long-Range Ecology Movements," in Sessions, *Deep Ecology for the 21st Century*, pp. 151-155.
133. Bender, *The Culture of Extinction*, p. 417-422.

134. *Ibid.*, p. 422-424, 435.

135. See Arne Naess, "Politics and the Ecological Crisis", and Arne Naess, "The Deep Ecology Eight Points Revisited", in Sessions, *Deep Ecology for the 21st Century*, pp. 445 and 219 respectively; To emphasize that *not* everything is politics, Naess said in the original 1973 article ("The Shallow and the Deep, Long-Range Ecology Movements") that "philosophy is the most general on the fundamentals (...) and political philosophy is one of its subsections".

136. See Arne Naess, "Deepness of Questions and the Deep Ecology Movement", Arne Naes, "The Deep Ecological Movement", and Stephen Bodian, "Simple in Means, Rich in Ends", all in Sessions, *Deep Ecology for the 21[st] Century*. For a more in-depth discussion of deep questioning and Naess's approach to deep ecology, see Harold Glasser, "Naess's Deep Ecology Approach and Environmental Policy"; Harold Glasser, "Demystifying the Critiques of Deep Ecology," in Zimmerman, *Environmental Philosophy*, 3[a] ed., pp. 204-217.

137. Arne Naess, "Politics and the Ecological Crisis," Naess, "The Third World, Deep Ecology, and Wilderness," and Naess, "Deep Ecology for the 22nd Century."

138. Naess, "The Ecofeminist versus Deep Ecology Debate," in Witozek and Brennen, *Philosophical Dialogues*, p. 270.

139. Katz, *et al. Beneath the Surface*, p. ix, xxii; For a critique of his characterization of deep ecology philosophy, see Andrew McLaughlin, "Keeping Deep Ecologists Together," paper delivered at the American Philosophical Association (Society for Philosophy and Technology) meeting, December 28, 2000.

140. Zimmerman, *Contesting Earth's Future*, p. 57-90.

141. Bill Devall and George Sessions, *Deep Ecology* (Utah: Gibbs Smith, 1985) pp. 161-177.

142. In her somewhat unusual encyclopedic entry "Deep Ecology," Australian ecofeminist Freya Matthews says that deep ecology became an activist movement when Naess replaced her 1973 analysis with the 1984 Eight Principles. This article does not show a thorough knowledge of the history of the movement; see Matthews, "Deep Ecology," in Dale Jamieson (ed.) *A Companion to Environmental Philosophy* (Oxford: Blackwell, 2003) pp. 218-32. Joanna Griffiths, "Naess at Ninety," *Resurgence* 217, March/April 2003, 44-45.

[lxiv] There is a Spanish translation: *The new ecological order. The tree, the animal and the man*, Tusquets, Barcelona, 1994. *N. from trans.*

143. Bron Taylor, "Deep Ecology and Its Social Philosophy: A Critique," in Katz, *et al. Beneath the Surface*, p. 269-99.

144. See, for example, Naess, "Politics and the Ecological Crisis."

145. Arne Naess, "Comments on Guha", in Witozek and Brennen, *Philosophical Dialogues*, p. 331.

146. Sadruddin Aga Khan, "Keeping to Our World," *Resurgence* 215 (2002): 20-21.

147. Al Gore, *Earth in Balance* (Boston: Houghton Mifflin, 1992).

148. *Newsweek*, July 17, 2006.

149. Andrew Kimbrell, "Biodemocracy," in *Resurgence* 214 (2002): 47-48; Lee-Anne Broadhead and Sean Howard, "The Heart of Darkness," *Resurgence* 221 (2003): 22-24.
150. Paul Shepard, "Ecology and Man: A Viewpoint." In Sessions, *Deep Ecology for the 21st Century*, p.

Presentation of “THE AUTHENTIC IDEA OF WILD NATURE”

Our main value is that of the autonomy of Wild Nature. However, some of us, despite correctly understanding the meaning of this concept, may not have cared much about the “theory” until now and the idea we have had about it has been a rather intuitive idea. For this reason, we believe that it will be interesting to deal with this concept in depth and from a rational and materialistic perspective.

To begin with, it is worth asking what is wild nature? Or rather, does wild nature exist or rather is it something “pristine” that disappears when a human sets foot in it? Is the idea of Wild Nature something solid and material on which to sustain an ideology or is it an ethereal concept more typical of philosophers?

In this text, Foreman delves into this concept and explains its meaning in a solid and justified way. Further, proof of the strength of —the very idea of Wilderness“, which Foreman summarizes as —land with a will of its own” or —land beyond human control“, is that the same meaning that Foreman gives for —wilderness ” (—wilderness”) has been used by the government of the United States to create the legal definition of —wilderness territory” and to give protection to its Law of Wild Spaces (—Wilderness Act”).

It is also interesting how in the last part of the text, to delve into his argument, the author goes through the history of conservationism in the United States, from its appearance in the 19th century to the current currents that try to recover wild areas , going through the appearance of ramifications with which the author does not feel identified, such as the fight against pollution or the fight for the efficient exploitation and prudent management of natural resources. For the Spanish reader it will be clear in this tour how the origin, foundations and evolution of this movement have nothing to do with European environmentalism and how most European environmentalist currents are incompatible with —the authentic idea of Wild Nature”.

THE REAL IDEA OF WILD NATURE

By Dave Foreman¹²³

Summary- In recent years, some philosophers, historians and literary critics have condemned what they call “The Commonly Accepted Idea of Wild Nature”[ii,iii]. Closer examination reveals that “The Commonly Accepted Idea of Wild Nature” is a literary/philosophical invention that bears little relation to The Real Idea of Wild Nature⁴ that conservationists have used to establish the National Wilderness Preservation System⁵ of the United States. The analysis of the origin of the English term *wilderness*, the meaning of the Wilderness Act⁶ and the history of the conservation movement show the solidity of —The Authentic Idea of Wild Nature” and of the National Wilderness Preservation System.

I am not here to praise “The Commonly Accepted Idea of Wild Nature” but rather to bury it. The very expression “The Commonly Accepted Idea of Wild Nature” evokes a mystical origin. If the idea of Wild Nature, which Baird Callicott⁷, Bill Cronon⁸, and other postmodern deconstructionist intellectuals so passionately consign to hell along

¹ Translation of —The Real Wilderness Idea”, by G. The original article appeared in David N. Cole, Stephen F. McCool, Wayne A. Freimund, Jennifer O’Loughlin (eds.), < em>Wilderness science in a time of change conference. Volume 1: Changing perspectives and future directions, USDA - Forest Service, 2000. *Translator’s note.*

² —Received Wilderness Idea” in the original. The expression —The Received Wilderness Idea” refers to certain theories defended by some intellectuals that have as a common denominator that all of them affirm that the notion of Nature or wild territory is a Western myth that has been culturally transmitted for centuries and that it does not correspond to the reality. According to these intellectuals, wild ecosystems do not really exist since all of them are altered to a greater or lesser extent by human activity. Apart from its debatable veracity (it is true that practically all ecosystems are humanized to a greater or lesser degree; but from there to denying the real existence of wild Nature there is an abyss that, depending on how we define —wild”, can be insurmountable), these theories are actually highly influenced by certain political motives (leftists) and philosophical tendencies (humanists). *N. from trad*

³ —Wilderness” is a term that is impossible to translate exactly in this case with a single Spanish term. —Wilderness” refers in English to the areas in which the ecosystems are little or not at all humanized, that is to say —wild areas (or lands). In this text I have translated it in different ways depending on the case. Generally, except in the cases that are explicitly indicated, I have translated it either as —wilderness areas” or as —wild nature”. *N. from trans.*

⁴ —The Real Wilderness Idea” in the original. *N. from trans.*

⁵ The Spanish translation of “National Wilderness Preservation System” is “National System for the Preservation of Natural Spaces” [of the United States]. Covers agencies charged with protecting federally designated and managed wilderness areas in the US *N. from trans.*

⁶ An approximate translation into Spanish of —Wilderness Act” is —Ley de Espacios Naturales”. The *Wilderness Act*, authored by Howard Zahniser of The Wilderness Society and signed into law by President Lyndon D. Johnson, created the legal definition of “wilderness” in the United States and meant the protection of 36,000 km[2] of federal land. *N. from trans.*

⁷ J. Baird Callicott (1941-), American philosopher specializing in ecological philosophy and environmental ethics. He was one of the pioneers in criticizing the concept of “Wild Nature”. *N. from trad*

⁸ William Cronon (1954-), is an American professor and researcher of geography, history, and environmental studies. He is one of the best-known critics of the concept of —Wild Nature“, funda-

with Milton's Lucifer⁹, has been the that most people have adopted, I think those intellectuals have come to that conclusion while holding hands in a dark room around a table at a séance, trying to listen to voices coming from the specters of Jonathan Edwards[1799] and Henry David Thoreau^{10, 11}.

But first, why should you pay attention to what I say about the idea of Wild Nature? Well, because I'm an expert on the True Wilderness Idea - the one that spawned the National Wilderness Preservation System. I have backpacked many wilderness areas for 40 years, I have descended wild rivers¹² for more than 30. During the thousands of days and nights I have spent in the wilderness for fun and conservation, I have had several hundreds of partners (not all at once!). I've listened to his thoughts on Wilderness as we strolled leisurely down dusty, rugged paths, navigated canyon walls aglow in the setting sun, and passed Scotch whiskey around a campfire. On many of these trips, my friends and I were checking out the wilderness¹³ of unprotected areas and putting together proposals to delineate these areas and send them to Congress for designation as protected. In the 1970s, I wrote a widely used guide, *How to Do a Wilderness Study*¹⁴. For all these reasons, I have a very clear idea of Wild Nature, one that is widely shared by other conservationists dedicated to the same thing. In 1971, while immersing myself in research on the wilderness of New Mexico, I found an entire collection of The Wilderness Society's journal¹⁵, *The Living Wilderness*, in the archives of the library of the University of New Mexico. I read every issue all the way back to the early 1930s. In the early 1960s, *The Living Wilderness* covered the campaign for the Wilderness Act in detail, including the arguments against it. for and against protecting wilderness. Since then I have read countless magazines, newsletters and calls to action from many wilderness advocacy groups. I have read dozens and dozens of brochures and maps from government agencies about wilderness.

mentally after editing the anthology *Uncommon Ground: Toward Reinventing Nature* (1996). *N. from trans.*

⁹ The author refers to the epic poem —Paradise Lost” by John Milton (17th century English poet and essayist), whose main characters are God, Satan, Adam and Eve. *N. from trans.*

¹⁰ Henry David Thoreau (1817-1862), was an American writer, poet and philosopher, of transcendentalist tendency and Puritan origin, his best known works are *Walden* and *Civil Disobedience* . *N. from trans.*

¹¹ In the original of this paragraph, the author makes a play on words with the double meaning in English of the term —received” (—received” and —commonly accepted”) that is impossible to adapt to Spanish without losing part of its meaning. He thus jokingly refers to the fact that these postmodern intellectuals *received* by —infused science” the belief that the idea of Wild Nature that they reject in their works is the *commonly accepted* < *notion of Wild Nature. /em>, rather than having gained direct, empirical knowledge of what the commonly accepted idea really is, if there is such a thing.* *N. from trans.*

¹² “I’ve been [...] a wilderness river runner” in the original. I have considered the phrase “I have descended wild rivers” as the best translation option. *N. from trans.*

¹³ “Wilderness qualities” in the original. I have considered “wild character” as the best translation option. *N. from trans.*

¹⁴ I have not found information on the work cited. *N. from trans.*

¹⁵ American conservation organization created in 1935. *N. from trans.*

My mentors in the conservation movement were people who led the Wilderness Act campaign and subsequent efforts to protect Wilderness Act affected areas (Forest Service Primitive Areas¹⁶ and National Parks road-free areas). and National Wildlife Refuges¹⁷, as well as Forest Service road-free areas. I was trained as a grassroots organizer by Clif Merrit¹⁸, who organized conservationists in the West to support the Wilderness Act, Ernie Dickerman¹⁹, who wrote the Eastern Wilderness Areas Act²⁰, and Harry Crandell²¹, who wrote the wilderness provision for the BLM charter²². Dave Brower²³, Ed and Peggy Wayburn²⁴, Stewart Brandborg²⁵, and Celia Hunter²⁶ instructed me on how wrestling through the wilds date back to the 1930s. I have spoken at length with the veterans of Silver City, New Mexico, who led the successful citizen struggle against the Forest Service's proposal to partition the Gila Desert²⁷ in 1952 (for the purpose of to allow felling). I have had the privilege of knowing Bob Marshall's brothers²⁸, Aldo Leopold's daughter²⁹, Mardie Murie (the widow of Olaus

¹⁶ The translation of "Forest Service Primitive Areas" is "Areas Primitivas del Servicio Forestal". It refers to the now deprecated designation of "Primitive Areas" by the Forest Service to refer to wilderness areas. *N. from trans.*

¹⁷ —National Wildlife Refuges" in the original. They are territories and waters designated for the conservation and management aimed at the sustainability of fauna and flora resources and their habitats. *N. from trans.*

¹⁸ Clifton R. Merrit (1919-2008), leading member of The Wilderness Society and founder of the American Wilderness Alliance (later known as the American Wildlands). *N. from trans.*

¹⁹ Enrie Dickerman (1910-1998) was a US wilderness advocate and conservationist. She was notable for, among other things, her interest in the eastern US wilderness. *N. from trans.*

²⁰ The approximate translation of —Eastern Wilderness Areas Act" is —Ley de Espacios Naturales del Este". *N. from trans.*

²¹ Harry B. Crandell (1924-1988), American biologist and conservation activist. Outstanding member of The Wilderness Society. *N. from trans.*

²² BLM (acronym for Bureau of Land Management), is an agency of the US Department of the Interior in charge of managing public lands. *N. from trans.*

²³ David Brower (1912-2000), American environmentalist, executive director of the Sierra Club from 1952 to 1969 and founder, among others, of the environmental organizations Friends of the Earth and Earth Island Institute. *N. from trans.*

²⁴ Edgar Wayburn (1906-2010) and his wife Peggy Wayburn (1918-2002) were American conservation activists. Peggy wrote several books on the wilderness, and Edgar was president of the Sierra Club several times during the 1960s. *N. from trad*

²⁵ Stewart Brandborg (1925-), American conservationist, activist, and citizen organizer, was executive director of The Wilderness Society for 12 years. *N. from trans.*

²⁶ Celia Hunter (1919-2001), famous American environmental activist and conservationist. *N. from trans.*

²⁷ —Gila Wilderness" could be translated as —Gila Desert". It was the first region to be designated as a wilderness area, in 1924, by the US government and, therefore, to be federally protected as such. He's in New Mexico. *N. from trans.*

²⁸ Bob Marshall (1901-1939), was an American forest ranger and wilderness activist. *N. from trans.*

²⁹ Aldo Leopold (1887-1948), was an American forester, well-known conservationist, and writer who popularized the idea of —land ethics." He had two daughters, Nina and Estella, both of whom were involved in the American conservation movement. Although here Foreman does not specify which of them he is referring to exactly. *N. from trans.*

Murie³⁰) and Sig Olson³¹. I applied his experience and wisdom as I became a national leader in wilderness campaigns related to RARE II³², the BLM wilderness revisions, and the Alaska Lands Act³³.

I have been present at dozens of public hearings - from Congress and agencies, in the field and in Washington cabinets - on the designation of areas as wilderness. I think I've met people involved in all the wilderness designation bills passed by Congress. For 30 years, I have been involved in wilderness strategy meetings and public presentations in virtually every state in the country. Over the past 15 years, I have given more than 200 wilderness lectures at colleges in 35 states and provinces in the US and Canada, and afterward have discussed wilderness with small groups of students at local bars. I have stood with members of Earth First!³⁴, risking arrest or physical harm in nonviolent acts of civil disobedience, to protect Nature³⁵ from bulldozers and chainsaws. I've attended a dozen professional meetings on wilderness organized by state and federal agency wilderness managers, and I know the key people in the agencies on the subject.

Among my personal files are three complete shelves of sound recordings of congressional hearings and committee reports on wilderness designation; all documents for the recommendation of wilderness designations in Forest Service primitive areas and in National and Park Service wildlife refuges; all official RARE II documents; all the BLM studies of wilderness in each of the western states; responses to all of them from conservation groups and 23 file cabinet drawers of wilderness material dating back to the 1960s (not counting a similar number of drawers of material on other conservation issues). Believe it or not, I've read it all.

During 20 years as writer, executive director or editor of the *Earth First! Journal* (from 1980 to 1988) and from *Wild Earth*³⁶ (from 1990 to today³⁷), I have read, re-

³⁰ Olaus Murie (1889-1963) was a US naturalist biologist and ecologist. Among other things, he was president of The Wilderness Society. His widow, Margaret Thomas (—Mardy) Murie (1902-2003), was a naturalist, writer, adventurer, and conservationist. He helped draft the Wilderness Act and the creation of the Arctic National Wildlife Refuge. *N. from trans.*

³¹ Sigurd F. Olson (1899-1982) was an American environmentalist and wilderness advocate. He wrote numerous books about it. *N. from trans.*

³² The RAREII (acronym for —Roadless Area Review and Evaluation II") was the second part of a study of roadless territories carried out by the US Forest Service between 1977 and 1979. Its objective was to examine and evaluate the roadless territories that were under its jurisdiction to decide which should be protected and which could be opened up to industrial development. *N. from trans.*

³³ The translation of "Alaska Lands Act" is "Alaska Territories Act". It is a US federal law passed by Congress in 1980 and signed by the president that same year. The act declared about 17,638,000 hectares (43,585,000 acres) of National Park in Alaska. *N. from trans.*

³⁴ Earth First! (EF!) is a radical environmental organization present mainly in several Anglophone countries. *N. from trans.*

³⁵ "Wilderness" in the original. In this case I have considered that the best translation is —Nature". *N. from trans.*

³⁶ Journal of conservation biology and wilderness activism published by the Wildlands Project from 1991 to 2004. *N. from trans.*

³⁷ Keep in mind that the article dates from 1999. *N. from trans.*

jected, accepted and edited more Wilderness articles I want to remember from both North America and the rest of the world. I spent eight years researching for my book, *The Big Outside*³⁸ (with Howie Wolke[xl] as co-author), about 48 minor road-free areas. Over the past 15 years I have been closely involved with leading conservation biologists working on protected area design and strategies for their protection. My work on the wilderness and that of close colleagues now reaches Mexico, Costa Rica, Canada, Chile, Argentina and South Africa. I have been personally involved in defending legally unprotected wilderness areas from dam building, water recreation, logging, road building, mining, oil and gas exploration and extraction, mining of uranium, the abuse of all-terrain vehicles, the poaching of reintroduced wolves, overgrazing, the clearing of juniper thickets with chains[xli], the construction of observatories and the introduction of exotic species. I have helped defend wilderness areas that were legally protected from dam building, overgrazing, pasture development, use of government vehicles, non-commercial logging, government hunting of predators, sabotage to the recovery of endangered species (the Gila trout[xlii]) and the invasion of mountain bikes and snowmobiles. We conservationists have not always succeeded in this defense, and I know of wild rivers now choked behind dams, magnificent forests being clearcut, towering moors razed by open-cast mining...

In short, I know something about the only idea about Wilderness that matters in practice - the one that has led thousands of people to spend their time, money, and sometimes their freedom and even their lives protecting it from exploitation. the wild areas. This is the idea of Wilderness that has been created by the National Wilderness Preservation System of the United States of America.

The True Wilderness Idea is something very different from the Commonly Accepted Wilderness Idea invented and later attacked by Baird Callicott, Bill Cronon and other deconstructionist social scientists. The philosophical and literary writings on which they were based have had little influence on the wilderness protection movement; in fact, scholarly and intellectual discussions of wilderness have been largely ignored by wilderness advocates. Since 1920, conservationists have been primarily motivated by two things: one, they like particular wilderness areas; and two, they see the need to protect them from development and exploitation. As Samuel Hays (1996), the great historian of resource conservation, Nature conservation, and environmentalism, writes, —Cronon’s Wild Nature is a world of abstract ideas...but separate from the values and ideas inherent to actions in favor of wilderness areas”.

This Commonly Accepted Idea of Wild Nature is a straw dog[xliii]; does not exist in reality. It is not the Wilderness idea that led to the Wilderness Act and the National Wilderness Preservation System and has spurred thousands of citizen conservationists from Alabama to Alaska. When fighting a ghost it is easy to say that the monster has been mortally wounded.

³⁸ Dave Foreman and Howie Wolke, *The Big Outside: A Descriptive Inventory of the Big Wilderness Areas of the United States*, Ned Ludd Books, 1989. *N. from trans.*

2,500 years ago, Socrates told Phaedrus[xliv], "I am a man who likes to learn and the trees and open spaces teach me nothing, while the men of the cities do." More recently, Nobel laureate Linus Pauling[xlv] (1995) wrote:

I remember reading a philosophy book in which the author returned page after page to the same question: If there is a leaf on a tree and you see that it is green in spring and red in autumn, is it the same leaf or are they leaves? different? Does the leaf still hold its essence? Words, words, words but 'chlorophyll' and 'xanthophyll' - which are what we can clearly perceive in relation to what has happened to the leaf - are simply not mentioned.

The so-called Commonly Accepted Idea of Wilderness comes from Socrates and his city cronies, not from the wilderness with trees and open fields. And among all the words written or spoken about the Commonly Accepted Idea of Wild Nature, there are no words about landscapes full of life and the political reality that threatens them.

I have spent my whole life confronting the lies, nonsense and myths of the extractive industries about Wild Nature. I have come to the conclusion that their woeful arguments against Wilderness are actually more legitimate, rational, and sound than those of the postmodern deconstructionists.

I am not going to respond point by point to leftist academic complaints about Wilderness. I've done it before, most recently in the Callicott/Nelson[xlvi] anthology, *The Great New Wilderness Debate*[xlvii], and I don't know of anyone who has refuted me on specific points (Foreman 1998). What

[xliii] —Straw dog" in the original. In this case, the expression "straw dog" is synonymous with the expression "straw man" (-straw man", scarecrow) which refers to a logical fallacy consisting of presenting the rival's argument in an altered way and then attacking it and demonstrating its falsity, instead of really attacking the true original argument. That is, create a "scarecrow" that you can "hit" (hence the expression) and give the impression of defeating him, instead of honestly facing the real rival. *N. from trans.*

[xliv] Phaedrus was an Athenian aristocrat (444-393 BC) close to the philosophical circle of Socrates and the protagonist, together with him, of Plato's dialogue that bears his name. *N. from trans.*

[xlv] Linus Carl Pauling (1901-1994), American biochemist. He was one of the first quantum chemists. *N. from trans.*

[xlvi] Michael P. Nelson is a professor of environmental philosophy and ethics at the University of Oregon. *N. from trans.*

[xlvii] J. Baird Callicott and Michael P. Nelson (eds.), *The Great New Wilderness Debate*, University of Georgia Press, 1998. This is an anthology of texts on the concept of wilderness. Ten years later, the same publishers published an I would like to do is to present, not the Commonly Accepted Wilderness Idea, but rather the Citizen Conservation Movement's True Wilderness Idea and how it remains strong after all these years, bringing together values and objectives, both ecological and from experience.

Land with a will of its own[xlviii]

In our apathetic age, when rigor in thought and ethics is too much to ask, we often end up grumbling over poorly defined words. From the beer biker[xlix] to the great academics to just about every other English speaker, they carelessly use the term *wilderness* muddying the conservation debate.

In 1983, in a talk at the Third World Wilderness Conference[1829]³⁹, in Scotland, the philosopher Jay Hansford Vest⁴⁰⁴¹ looked up the meaning of wilderness in Old English and, further back, in Old Gothic languages. He showed that *wilderness* means —'land with a will of its own'... emphasizing its intrinsic intention." He interpreted *der* as *of the*. what in *wil-der-ness* there is a 'will-of-the-earth', and in *wildeor*[liii] there is a 'will of the animal'.

A wild animal is 'an animal with a will of its own' - an untamed animal; similarly, *wildland* is 'land with a will of its own'. Vest shows that this intentionality is the opposite of the —controlled and ordered environment, characteristic of the notion of civilization". The first inhabitants of northern Europe did not feel the impulse to reign over Nature; therefore, the term *wilderness* —shows an appreciation of the land in and of itself" (Vest 1985). Thanks to Vest we are able to understand that this term, *wilderness*, is not an invention of modern civilization; is a word created by the pagan barbarians of the Bronze and Iron Ages.

This meaning of *wilderness*, as "land with its own will", dwarfs all others. *Wilderness* means —land beyond human control". A "land beyond human control" is a slap in the face to the arrogance of humanism — for elitist man as well as for common man, for capitalist as well as for socialist, for first worlder as well as for the third world; for all of them it is also something to fear.

I have called the wilds[liv] the arena of evolution. Anyway, Aldo Leopold, as usual, was way ahead of me. 50 years ago, he saw Wilderness as the —theater" for —the spectacle of evolution." (Leopold 1989). Evolution has its own will. The land on which evolution can occur has a will of its own, especially in the case of large species.

The Wilderness Act

The greatest gesture of the civilized world in favor of the "land with its own will" materialized with the Wilderness Act of 1964, in the United States. This legislation was the product of eight years of discussions and revisions both in Congress and in public speaking throughout the nation. It was promoted by hikers, on foot or on horseback, canoeists, hunters and fishermen. Contains at least four definitions of *wilderness*. I believe that each of the four definitions fully maintains the meaning of land with its own will. The first definition of —wilderness" is found in the Wilderness Act's statement of purpose, in section 2(a):

To ensure that growing population, accompanied by urban sprawl and increased mechanization, does not occupy and modify all areas within the United States and its

³⁹ Third edition of the World Wilderness Congress, the oldest forum on environmental issues ever held. *N. from trans.*

⁴⁰ Philosopher and professor at the University of North Carolina. *N. from trans.*

⁴¹ —Self-willed land", in the original". *N. from trans.*

domains, without leaving designated lands to be preserved and protected in their natural condition, hereby declares that it is the policy of Congress to assure the American people of present and future generations the benefits of a lasting heritage of wilderness[lv].

Has Congress, spurred on by American citizens, established a National Wilderness Preservation System[lvi] to preserve a mythical past cloaked in literary romanticism, swashbuckling Manifest Destiny[lvii] and Calvinism? dualist[lviil]?[lix] Well... no. It was much simpler. Wilderness needed to be protected because all of the remaining countryside in the United States was threatened by development and industrial exploitation fueled by population growth, mechanization, and urban sprawl.

Both in this case and throughout the rest of the history of the movement for the conservation of Wilderness the main motive has been to protect the land from development. Hays (1996) writes: —Wildness proposals are not normally intended to perpetuate some 'original' or 'pristine' condition but rather as attempts to 'save' wilderness from development[lx]". Wilderness areas are therefore lands protected from the conquest of industrial civilization. How hard it is to understand?

The second definition is the ideal:

A wilderness, as opposed to those areas where man and his labors dominate the landscape, is hereby recognized as an area where the land and its biotic community are free from man-imposed fetters, where man himself is a visitor who does not stay. Section 2(c).

It was written by Howard Zahniser of The Wilderness Society who, as a professional writer and editor, understood the importance of choosing words, this definition coincides with the concept of land with its own will. First, wilderness areas are not ones where the labors of man dominate the landscape. Wilderness is not subject to human will. Second, Zahniser carefully chose the little-known expression —they are untrammelled"[1833]" and not just because it sounded good. A *traba* is the manacle of a horse, therefore it is something that hinders free movement.[lxii] As a verb, *trabar* means to hinder the movement of something. *Unhindered* therefore means that something's will is not hindered; that has a will of its own. The untrammelled land is the arena of evolution. Third, humans are only temporary visitors to the wilderness; there are no permanent human settlements. Many of Wild Nature's enemies especially hate this exclusion from human habitation. However, I believe that this absence of lasting human settlements is key to Nature having a will of her own. Wherever we humans dwell for a long period of time, we hinder or impede the will of the land around our settlements and beyond. Until where? That depends on the population size and the technological sophistication of the group.

The third definition of *wilderness* follows immediately from the second. It is the concrete and practical definition of the wild areas protected by the Wilderness Act and establishes a starting criteria for candidate areas:

A wilderness is defined hereinafter, in this Act and for this Act, as an area of undeveloped federal land that maintains its original character and influence, without

permanent improvements or human settlement; that it is protected and managed in order to preserve its natural conditions and that (1) it generally appears to have been affected primarily by the forces of nature, without an appreciable trace of human activity; (2) possesses exceptional opportunities for solitude or for primitive, outdoor recreation; (3) has at least 2,025 hectares[lxiii] of land or is of sufficient size to enable its preservation and use and to be maintained in perfect condition; and (4) may also contain ecological, geological, or other qualities of scientific, educational, scenic, or historical value. Section 2(c)

While maintaining the concept of land with its own will (“undeveloped”, “primitive character and influence”, “without permanent improvements or human settlement”, “natural conditions”), it is a working definition that recognizes that most of the land with a will of its own may not be pristine (“generally appears”, “mainly affected”, “without appreciable footprint”). In fact, the word *pristine* does not appear in the Wilderness Act.

This realistic view of wild Nature answers the often silly question, “What is natural?” Understand that the *natural* is not something separate from and opposed to the *unnatural*. Rather, I think the definition sees the earth as encompassing a continuum from that which is completely subject to human will to that which has a will entirely of its own. At some point, the earth is mostly dominated by humans, at some other point, the earth begins to be controlled mainly by the forces of Nature.[lxiv] There is a wide gray area in between where there is some contribution natural and human forces. When natural forces become dominant, the earth has a will of its own. Given that we humans have different and limited ways of understanding ecology and different depths of knowledge, each one can locate the transition between the zones that have their own will and those that do not at different points of that continuum. But this does not mean that we cannot say, “This place is mainly natural.” Let us not fall into the deceptive trap of thinking that natural character[lxv] is simply a human idea. The wild[lxvi] exists out there. A tree that falls in a forest does not need someone to hear it to exist.

The ecological wounds suffered by the earth are the result of humans trying to impose their will. The severity of these wounds and their impact remain both where the earth has its own will for the most part (areas primarily affected by the forces of Nature) and where it does not. Some enemies of Wilderness mistakenly believe that conservationists view Wilderness as pristine (an absolute term). Other anti-conservationists, in order to limit protection, argue that to qualify as wilderness it must be pristine. Neither of these refrains is true.

If we read section 2(c) of the law carefully, we see that there are two definitions of *wilderness*, linked together. One refers to human experiences in the wilderness (“seems”, “traceless”, “loneliness”, “primitive and outdoor recreation”, “educational”, “historical”, “landscape”). The other is an ecological definition (“undeveloped”, “primordial character and influence”, “natural forces”, “ecological”, “scientific”). Understanding that these descriptions of ecological conditions and values figure promi-

nently in the Wilderness Act refutes the persistent accusation that this act and the National Wilderness Preservation System that came from it are only concerned with recreation and landscaping. Even some scientists and conservationists have criticized the Wilderness Act for having an overwhelmingly recreational bias. It is important to understand that this is not the purpose of the law, even though federal agencies have often managed wilderness as if it were.

The two lessons we need to draw from section 2(c) are: that wilderness does not have to be pristine and that the ecological values of wilderness are strongly recognized alongside the values of human experiences.

The fourth definition of *wilderness* contains rules for managing an area, once it comes under the protection of the Wilderness Act:

Except for the specific cases specified in this Law and subject to existing private rights, there will be no commercial activities or permanent roads within any wild territory[lxvii] designated by this Law and, except for those necessary to carry out the minimum requirements for the administration of the area enforces this Law (including measures required in emergencies involving the health and safety of persons within the area), there will be no temporary roads, no vehicles, equipment or motorized boats will be used, no aircraft will land , nor will there be any other form of mechanical transportation or any structure or facility within the designated areas. Section 4(c).

lxiv—At some point, land quits being mostly dominated by humans; at some other point, land begins to be controlled primarily by the forces of Nature”, in the original. The literal translation would be: —At some point, the earth ceases to be dominated for the most part by humans; at some other point, the earth begins to be controlled mainly by the forces of Nature” but this does not make logical sense since both points refer to the same state. It is probably a logical error by Foreman, so it has been decided to correct said error in the translation. *N. from trans.*

[lxv] —Naturalness” in the original. I have considered the best translation is —natural character.” *N. from trans.*

[lxvi] —Naturalness” in the original. I have considered that the best translation is —the wild”. *N. from trans.*

[lxvii] —Wilderness area” in the original. In this case I have translated it as “wild territory”. *N. from trans.*

(Elsewhere, the Wilderness Act makes certain exceptions to earlier prohibitions to, for example, fight fires, facilitate rescues, or allow grazing and mining until 1984; all of these exceptions were political deals that Wilderness supporters Act had to agree to get Western congressmen to pass this point, so the Wilderness Act kind of fails and sometimes contradicts itself.)

Bans try to keep the land unhindered (with their own will). The bans are stricter than the starting criteria described in section 2(c). For example, it is not a requirement that a wilderness area that is a candidate to enter under the protection of the Law, does not have roads or has not been felled in it; however, section 4(c) implies that it must be managed as a roadless zone once it has been placed under the auspices

of the National Wilderness Preservation System. In other words, existing roads will have to be closed and commercial logging will no longer be allowed once an area is officially designated as wilderness[lxviii]. There are many cases of areas that before coming under the umbrella of the National Wilderness Preservation System had roads or were logged on them - including some of the classic Great Wilderness[lxix] of the West.

If the meaning of *wilderness* and what the Wilderness Act says are clearly spelled out, many misunderstandings about wilderness[lxx] should go away. However, as we see all too often, the meaning of the concept of Wilderness is not always clouded due to sheer ignorance, rather such confusion is a deliberate tactic used by anti-conservationists.

The contention over conservation is ultimately about whether or not we can stand the earth having a will of its own.

The Wild River

In —Rewilding and Biodiversity: Complementary Goals for Continental Conservation”[1834]⁴², Michael Soulé[lxxii] and Reed Noss[lxxiii] (1998) clearly show that the designation of nature reserves based on criteria Scientists do not overthrow the traditional way of designating wilderness, but rather complement it. To understand this, we will need both an overview of the conservation movement and a metaphor to describe it.

The metaphor I use is to think of the conservation movement as if it were a river, with tributaries coming down from high ground and glacial cirques to mix and flow together in the main basin. From the air, from a bird’s eye view, we will have a good perspective that will allow us to see the entire basin stretching out in front of us. The headwater streams that flow together to form the Río Salvaje are those for wildlife protection, management, beauty protection, and forest protection. Downstream, they are joined by tributaries of wilderness protection, ecosystem representation, carnivore protection, connectivity[lxxiv], and wilderness restoration[lxxv]. Nearby, but separately, are the river basins of “recursismo[lxxvi]” and environmentalism[lxxvii]. I see environmentalism (fighting pollution), conservationism (wildlife and wildlife protection), and resourceism as separate movements that differ in their views of humans and Nature. Some of the streams at the headwaters of the Río Recursismo originate from the same cliffs and peaks that feed the Río Salvaje, however, they flow in different directions. The Río Ambientalismo and Río Salvaje do not originate in the same watershed, although their courses later flow parallel with only a narrow strip of land separating them. All the streams that feed the conservation movement spring from protecting the land and wildlife from the threats of development and exploitation.

From the furthest pass flow the rough waters of the stream of the Protection of Wild Fauna. Contrary to popular belief, American conservationism was born from the

⁴² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

protection of wildlife and not from the protection of forests. English aristocrat William Henry Herbert came to America in 1831 and brought with him the "sports hunter code." In his role as a man of the woods as "Frank Forester"^{43TM44}, Herbert fought against the predatory nature of commercial hunting at the time and encouraged sport hunters to unite and fight against hunters. unscrupulous[lxxix]. The national hunting magazines were born in the 1870s and joined the fight against the commercial exploitation of hunting and fishing and in favor of the protection of habitats. Sport hunters and their magazines went on a rampage against the unreason of the bison slaughter. The first national conservation group was not the Sierra Club (founded in 1882) but the Boone and Crocket Club[lxxx], founded in 1887 by Theodore Roosevelt[lxxxi] and his fellow hunters. The role of the Boone and Crocket Club in creating the first national parks, wildlife refuges, and forest preserves has been largely overlooked by historians as well as conservationists today (Reiger 1990).

The second stream of the header is that of Management. One of the most prominent Americans of the 19th century was George Perkins Marsh[lxxxii] of Vermont. As ambassador, under the presidency of Lincoln[lxxxiii], first in Turkey and later in Italy, Marsh visited different places in the Mediterranean where, among the ruins of classical civilizations, he found the ruins of the earth. The rocky, treeless hills of Greece were as much a testament to a vanished civilization as was the crumbling Acropolis. His 1864 book, *Man and Nature; or Physical Geography as Modified by Human Action*, is one of the reference texts both in history and science. In it he wrote: —Wherever he goes, man is nothing but a disturbing element. Wherever he steps, he turns the harmony of nature into discord." Phillip Shabecoff (1993), who was the first foreign correspondent for the *New York Times* and later an environmental reporter, wrote: —Marsh was the first to demonstrate that the cumulative impact of human activity was not negligible and that, far from being benign, it could cause permanent and widespread destruction on the surface of the earth." In addition, the Maltusiano spring [lxxxiv] also feeds the Gestión stream. Management is necessary to combat soil erosion and other negative consequences of careless land use; more recently, management has tried to deal with the threats of human population growth and resource depletion.

The third stream in the headwaters is the Beauty—protection of national parks and other similar places to safeguard their spectacular and inspiring landscapes. Yosemite Valley[lxxxv] in the

[lxxvii] —Environmentalism" in the original. *N. from trans.*

[lxxviii] Frank Forester is the pseudonym with which Henry William Herbert signed his writings. *N. from trans.*

⁴³ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

⁴⁴ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

[lxxix] —Game Hogs” in the original; literally means —the hogs of the hunt” and refers to hunters who hunt abusively. For reasons of style I have considered that it is better —unscrupulous hunters”. *N. from trans.*

[lxxx] The name of the club refers to the legendary American hunters and trappers Daniel Boone and David Crocket. *N. from trans.*

[lxxxix] Theodore Roosevelt (1858-1919) was the twenty-sixth president of the US *N. from trans.*

[lxxxii] George Perkins Marsh (1801-1882), was a United States diplomat and philologist. *N. from trans.*

[lxxxiii] Abraham Lincoln (1809-1865) was the 16th President of the United States, considered by some to be the first conservationist in the United States. *N. from trans.*

[lxxxiv] In reference to the famous principle of Thomas Robert Malthus (1766-1834), an English economist and demographer. Author of the theory on the gap between the rate of population growth and the rate of growth of resources; According to this principle, the population grows faster than the resources, leading to its progressive impoverishment. *N. from trans.*

[lxxxv] Protected Natural Area of the United States; is located in the state of California. *N. from trans.*

California’s Sierra Nevada[lxxxvi], was not discovered by white settlers until 1851 and the huge redwoods[lxxxvii] around it were not described until 1852. Within a few years the valley and the redwoods were attracting visitors who wanted to behold their splendor. In 1859, Horace Greeley, editor of the *New York Tribune*[lxxxT111], visited Yosemite Valley and wrote for his readers that it was ”the most unique and majestic of natural wonders.” (Runte 1987). Five years later, on June 30, 1864, while taking a break from the burden of the Civil War[lxxxix], President Abraham Lincoln signed a document transferring ownership of the beautiful Yosemite Valley and redwood forest Mariposa Grove[xc] to California status as a public park.

American citizens supported the preservation of Yellowstone[xci], Yosemite, and the rest of the early national parks primarily because of their beauty, although other factors, such as easy rail access, helped drive the political decision. Conservationists feared that all of America’s natural wonders would be threatened by the development of mass tourism and industrial exploitation, as had been the case since the 1830s at Niagara Falls . Alfred Runte[xcii] (1987) writes: —In the fate of Niagara Falls, Americans found compelling reasons to take conservation seriously... A continuous parade of European visitors and onlookers embarrassed the nation in condemning the commercialization of Niagara.” All of this also happened, and in a similar way, in the conservation movement in Canada.

The fourth and last stream in the headwaters is the Forest Protection. It is born from a mountain lake, it falls in the form of a waterfall but just after a rock ledge divides it into two courses. One of them flows into the River of Recursiveness with Gifford Pinchot[xciii], and the other joins the Wild River with John Muir[xciv]. In the 1880s, business interests in New York City led to calls for protection of the Adirondacks[xcv]

to ensure a quality water supply from the headwaters of the Hudson River[xcvi]. In the West, irrigators and cities were concerned about the destruction of river basins due to overgrazing and logging in the highlands, and therefore asked for their protection. Lovers of the forests, led by John Muir, feared that all natural forests would be razed to the ground by logging companies. New York protected the state lands of the Adirondacks, and Congress authorized the President to preserve the forests of the West.

The Forest Reserve Act[xcvii] of 1891, as Samuel Hays (1979) explains, —was limited to establishing forest reserves but did not specify anything about their management”. Conservationists, from Muir to the sport hunters of the Boone and Crocket Club, hoped to keep forest preserves from commercial logging, grazing, and other uses. They wanted the reserves to be protected for their water, recreational and landscape values as well as to serve as habitat for wildlife. However, Gifford Pinchot called for ”management” that included logging, grazing, and dam construction.

[lxxxvi] Mountain range located in the state of California and in certain places bordering the neighboring state of Nevada. *N. from trans.*

[lxxxvii] *Sequoiadendron giganteum*. *N. of the trad.*

[lxxxviii] New York newspaper founded in 1841 by Horace Greeley, now deceased. *N. from trans.*

[lxxxix] Refers to the American Civil War (1861-1865). *N. from trans.*

[xc] Redwood forest located in the southernmost part of Yosemite National Park. It is the area of the park with the largest number of giant sequoias. *N. from trans.*

[xci] In reference to the Yellowstone National Park protected since 1872 and the first national park in the world. Its location is divided between the states of Montana, Idaho and Wyoming. *N. from trans.*

[xcii] Alfred Runte is an American environmental historian. *N. from trans.*

[xciii] Gifford Pinchot (1865-1946) was an American politician, agricultural engineer, and botanist. He was the first head of the United States Forest Service; During his mandate, he stood out for defending the conservation of the nation’s reserves through a planned use of them to allow their constant renewal. *N. of the trad.*

[xciv] John Muir (1838-1914) Scottish-American naturalist and conservationist. *N. from trans.*

[xcv] Mountain massif located in northwestern New York State; in 1882 it was declared a national park. *N. from trans.*

[xcvi] River 506 kilometers long that runs mainly through the state of New York. *N. from trad*

[xcv]” Law passed in 1891 authorizing the President of the United States to ’set aside’ lands from the public domain and establish forest reserves on them; these lands would be managed by the Department of the Interior. *N. del trad.*

The Organic Law of 1897, spurred on by Pinchot, opened the reserves to commercial exploitation. In any case, for both Muir and Pinchot, protecting forests was a response to the threat posed by uncontrolled and inefficient logging.

Downstream, another tributary - the Wild Territory[xcviii] - joins the Wild River. The movement focused on the preservation of wild areas was born at the hands of Forest Service agents, such as Art Carhart and Aldo Leopold. Leopold, who protested against the automobile encroachment on the countryside[xcix], feared that increasing automobile access to national forests would destroy and replace the skills of early forest rangers. He wanted to preserve the possibility of experiencing what he had experienced when he visited the Apache National Forest in Arizona in 1909. Leopold said “Wild areas are mostly havens for travel by primitive means, especially by canoe and on foot” (1987). In 1921, he defined wilderness as —an unbroken expanse of land preserved in its natural state, where legal hunting and fishing can be done, large enough to travel on foot for two weeks without seeing roads, manmade roads, huts nor other works of man. (Leopold 1921). The countryside was threatened by cars and roads. I needed protection. In the 1930s, conservationists such as Bob Marshall called for protecting existing wilderness areas within national parks as they were being threatened by proposals from both the Forest Service and the tourism industry to build scenic highways.]

On the other bank of the Río Salvaje, just downstream from the confluence with the tributary Territorio Salvaje, the tributary Representación de los Ecosistemas empties. As early as 1926, *The Naturalist's Guide to the Americas*, edited by prominent biologist Victor Shelford[cii], called for the protection of ecologically representative natural areas. Both the National Audubon Society[ciii] and The Nature Conservancy[civ] have attempted to purchase and protect ecosystems that were not represented in state and federal protected areas. The National Park Service and conservationists have attempted to establish national parks representing all the major ecosystems, though, admittedly, without complete success. The Eastern Wilderness Areas Act of 1975, which established legal protection for national forest wilderness areas east of the Rockies, was explicit about the representation of different ecosystems. During RARE II, the Forest Service, with the support of conservationists, sought to designate new wilderness areas to protect previously unprotected ecosystems. This search was motivated by the threats that development entailed. However, the fight for the representation of ecosystems has not achieved the necessary relevance. In a special report for the Department of the Interior, Reed Noss and coauthors (1995) detail the poor record of the United States in protecting representative ecosystems.

Below, the Predator Protection tributary bursts forth like an impressive waterfall. In —A Natural Refuge Plan”, unanimously approved by the Ecological Society of America[cv] on December 28, 1932, Victor Shelford wrote, —Biologists are beginning to realize that it is dangerous to modify nature by introducing plants or animals , eliminating predators or favoring herbivores...”. The Ecological Society said that entire communities of native species should be protected, including large carnivores and the natural fluctuations that occur in the number of individuals of a species (Shelford 1933). Back then protecting wolves and cougars was very daring, so in my metaphor I represent this tributary as a

xcviu —“Wilderness” in the original. In this case I have translated it as “Wild Territory”. *N. from trans.*

xcix —“Ford dust” in the original; the literal translation would be something like “the dust storms raised by Ford brand cars”, for reasons of style I have translated it as “car invasion of the countryside”. *N. from trans.*

[c] National Forest established in 1908 and located in the state of Arizona. *N. from trans.*

[ci] —“Scenic highways” in the original. *N. from trans.*

[cii] Victor Shelford (1877-1968) was an American zoologist and ecologist. *N. from trans.*

[ciii] American NGO founded in 1905 and dedicated to nature conservation. *N. from trans.*

[civ] International NGO dedicated to the conservation of biodiversity and the natural environment. *N. from trans.*

[cv] American professional organization of ecologists who carry out scientific studies, in different branches, on how organisms relate to their environments. *N. from trad.* waterfall. Large carnivores were clearly under threat of disappearing from the United States, even in national parks.

In the 1960s another tributary of the conservation river was born with the work of EO Wilson[cvi] and Robert MacArthur[cvii] on island biogeography[cviii]. *The number of species per unit area* is closely related to the biogeography of islands. Michael Soulé (1995) writes, —“One of the principles of modern ecology is that the number of species that a given area can support is directly proportional to its area. As a corollary, if the area is reduced the number of species falls”. Species-area relationships have been shown with birds, mammals, reptiles, and other animals on the Greater Sunda Islands[cix] (located in the Malay Archipelago), on Caribbean islands, and elsewhere. An accepted ecological rule is that if the area occupied by a habitat is reduced by 90 percent, 50 percent of the species will be lost.

In 1985, University of Michigan ecologist William Newmark, looking at a map of the western United States and Canada, realized that our national parks were islands. As the sea of settlement and logging engulfed North America, national parks became ecological islands surrounded by human-dominated land. Could the theory of island biogeography be applied to this situation? Newmark realized that the smaller a national park was, and the more isolated it was from other wilderness, the greater the number of species it had lost. The first species to disappear had been those that needed wide range areas —like the lynx and the wolverine[cx]. Species loss (*relaxation* in ecological jargon) had occurred and *was still occurring*. Newmark (1987) predicted that all national parks would continue to lose species (as Soulé had previously predicted for reserves in East Africa). —“Without the active intervention of park managers, it is quite likely that as the isolation of western North American parks grows the loss of mammals will continue.” Even Yellowstone National Park is not large enough to support viable populations of all the mammals that need extensive ranges. Only the complex formed

by the connection of all the national parks of the Canadian Rockies reaches an area large enough to guarantee its survival.

Bruce Wilcox[cxi] and Dennis Murphy[cxii] (1985) wrote that —habitat fragmentation constitutes the most serious threat to biological diversity and is the main cause of the current extinction crisis”. Reed Noss, then at the University of Florida, responded to this warning by designing a conceptual system of nature reserves for Florida, consisting of core reserves each surrounded by buffer zones and interconnected by ecological corridors. In an article presented in 1986 at the Natural Areas Conference[cxiii], Noss (1987) said: —The problems of habitat isolation, derived from their fragmentation, can be mitigated by connecting natural areas through corridors or zones with suitable habitats.

This tributary of connectivity was born as a consequence of the threats of fragmentation posed by dams, highways, logging and other dangers inherent to development.

Those of us who navigate rivers know that it can take a long time before the water of a tributary mixes completely with the main current. We see this in the Yukon[cxiv], when a

[cvi] Edward O. Wilson (1929-) is an American biologist; He is mainly known for his works on evolution and on sociobiology. He also stands out for his work on the theory of island biogeography. *N. from trans.*

[cvii] Robert MacArthur (1930-1972) was a Canadian biologist noted for his work in population ecology and community ecology. *N. from trans.*

[cviii] Island biogeography is a field within biogeography that attempts to study the factors that affect the number of species existing within an isolated biotic community. *N. from trans.*

[cix] The Greater Sunda Islands are a group of islands that includes Borneo, Java, Sumatra, and Celebes. *N. from trans.*

[cx] *Gulo gulo*. *N. from trans.*

[cxi] Bruce Wilcox is an American conservation biologist. He was one of those responsible for coining the term conservation biology. *N. from trans.*

[cxii] Dennis Murphy is a conservation biologist at the University of Nevada. *N. from trans.*

[cxiii] Annual congress of the American NGO Natural Areas Association, focused on bringing together and giving support to people and institutions that work in the management and protection of natural areas. *N. from trans.*

[cxiv] The Yukon is the westernmost of Canada’s three Northern Territories. *N. trad.* milky stream of melting ice empties into the clear waters of another river. A similar scene is repeated in the Southwest, when a clear mountain stream mixes with the reddish waters of a silt-filled river. For miles the two separate streams can be seen by color.

The above is what has happened in our river. The tributaries of wildlife protection, management, beauty, forest protection, and wilderness protection have mixed together quite well; however, the tributary waters of ecosystem representation, predator protec-

tion, and ecosystem connectivity have not blended as well. Today, a new tributary has been added - Wilderness Restoration. Unlike the previous currents, this one mixes well with the previous ones, merging into a deep, wide and powerful river.

Soulé and Noss (1998), —distinguish three independent features that characterize the current movement for the restoration of wilderness areas:

- Large and strictly protected reserves-nucleus (the wild).
- Connectivity.
- Key species.”

In short, these are —the three Cs: Cores, Runners and Carnivores’””“.”

The wilderness restoration approach is based on recent scientific findings showing that the integrity of ecosystems often depends on the role played by large ’arnivores. Mi’hael Soulé and his graduate students (1988) have shown that native songbirds thrive in large suburban San Diego yearlings where there are oyotes; these birds will disappear faster when they also disappear in the oyotes. The ’oyotes eat the foxes and the prolific domestic cats. Foxes and cats ’omen ’odorni’es, desert matra’as[’x’i], thrushes and their clutches are also ’ome[’x’ii].

In the East, Da’id Wil’o’e[’x’iii], an e’ologist working for the En’ironmental Defense Fund[’xix], has discovered that some ’eating birds are ’last of the elimination of wolves and cougars. As we have already seen, the decrease in the population of a’es ’antors’ as a consequence of the fragmentation of the forests is well documented, however, Wil’o’e (1986) has shown that this decline is, in part, due to the absence of large amphibians in the East. Cougars and gray wolves don’t ’eat urru’as[’xx] or their eggs, but mapa’hes, foxes, skunks[’xxi] and opossums[’xxii] yes ha’en; and cougars and wolves eat these medium-sized predators. When large mu’ha’hos[’xxiii] are wiped out, populations of medium-sized mu’ha’hos’xxiv skyrocket—with dire results for the birds. Soulé refers to this phenomenon—the multiplication of the number of medium-sized predators in the absence of large predators—as

[cxv] In English —núcleo” is —core” that is why Foreman calls these three fundamental features the three Cs; alluding to the initials of ’cores (nuclei), corridors (runners) and carnivores (carnivores)’. *N. from trans.*

[cxvi] *Campylorhynchus brunneicapillus*. *N. from trans.*

[cxvii] —Foxes and cats eat quail, cactus wrens, trashers and their nestlings”, in the original. —Quail” is the common name given to different genera of the order Galliformes. It includes the different species of quail but also breadsticks and humps. As for —Thrashers”, it is used to refer to 15 species of the family Mimidae (family of passerine birds). However, for simplicity, since the meaning of the text is not altered, it has been translated —quail” by —quails” and —thrashers” by —thrushes”. *N. from trans.*

[cxviii] David Wilcove is a conservation biologist at Princeton University. *N. from trans.*

[cxix] Environmental NGO based in New York. *N. from trans.*

[cxxx] —Warblers” in the original. At first, in English, the term —warbler” referred to the warblers of the Old World (genus *Sylvia*), but later, after the colonization of North America and other continents, this term has been used as a common name to designate numerous species of passerine birds (birds) that in reality are not always related to the sylvids. In the absence of more information, it is difficult to know exactly what species of bird Foreman is referring to in this case. *N. from trans.*

[cxxxi] Carnivorous mammals of the family Mephitidae. *N. from trans.*

[cxxxii] *Didelphis virginiana*. *N. of the trad.*

[cxxxiii] —Big guys” in the original. *N. from trans.*

[cxxxiv] —Middling guys” in the original. *N. from trans.*

mesopredatory explosion[cxxv]. John Terborgh[cxxvi] of Duke University (in my opinion the dean of trophic ecology) is currently studying the ecological effects of removing jaguars, pumas and the greater harpy[cxxvii] in tropical forests. It tells us that large carnivores are the primary regulators of prey numbers—the opposite of what was once ecological orthodoxy. He has also discovered that the elimination or population reduction of large carnivores can alter the composition of plant communities, specifically, the ratio between large-seeded and small-seeded plants, this is due to increased seed consumption. and of shrubs due to the superabundance of herbivores whose numbers are normally regulated by large carnivores. This is known as a *trophic cascade*[cxxxviii] (Soulé and Noss 1998). There is convincing evidence for the existence of this top-down regulation in forests outside tropical areas as well.

Wilderness restoration is, according to Soulé and Noss, “the scientific argument for restoring large wilderness areas based on the regulatory role played by large carnivores.”

Three main scientific arguments make up the case for wilderness restoration and justify the emphasis on the importance of top predators. First, the structure, resilience[cxxix] and diversity of ecosystems are often underpinned by ‘top-down’ ecological (trophic) interactions, initiated by apex predators (Terborgh 1988, Terborgh *et al.* 1999). Second, predators that need large home ranges typically need large pockets of protected territory for foraging, seasonal movement, and other needs; such species justify the need for large areas. Third, connectivity is also necessary because in most regions, core reserves are usually not large enough; For this reason, they must be connected to ensure the long-term viability of species that require large ranges. In summary, the argument for the restoration of wild areas postulates that large predators often contribute decisively to maintaining the integrity of ecosystems. For their part, large predators require extensive and interconnected spaces (Soulé and Noss 1998).

If large autochthonous carnivores have been extirpated from a region, their reintroduction and recovery is essential to a conservation strategy. Wolves, grizzly bears, cougars, bobcats, wolverines, black bears, jaguars, and other apex predators need to be restored to their natural ranges across North America.

Despite the fact that Soulé and Noss (1998) affirm that —Our main postulate is that the restoration of wild areas is a crucial step to restore self-regulating communities”, they claim two justifications that are not scientific: (1) —the ethics of responsibil-

ity human,” and (2) —the emotional and subjective essence of ‘the wild’ or wilderness. Wilderness areas are hardly ‘wild’ where apex predators such as cougars, wolves, wolverines, grizzlies or black bears have been extirpated. Without these components, nature appears somehow incomplete, truncated, too domesticated. Human opportunities to be humble are reduced.”

What Soulé and Noss have done marks a milestone of crucial importance for the wilderness conservation movement as well as for those more concerned with protecting biological diversity. They have developed the *scientific basis* to justify the need for large wilderness complexes. Here, science underpins the desires and values of those who recreate in the wilderness. The great wildernesses are not only necessary to be inspired and to experience what

[cxxv] —Mesopredator release” in the original. *N. from trans.*

[cxxvi] John Terborgh is an American conservation biologist. *N. from trans.*

[cxxvii] *Harpia harpyja*. *N. of the trad.*

[cxxviii] —*Top-down regulation*” in the original; although the literal translation —top-down regulation” is perfectly understandable given the context -in fact it is the translation that I have used elsewhere- here I have preferred to use the term *trophic cascade* since this term is widely used in Spanish to designate —regulation from top to bottom”. *N. from trans.*

[cxxix] Resilience in ecology is the ability of ecosystems to absorb and recover from disturbances. *N. of the wild trans.* in them but are absolutely necessary for the protection and restoration of ecological integrity, native species and evolution.

In some of his writings, Soulé describes wilderness areas as self-regulated, which is just another way of saying that they have a will of their own[cxxx] or that they have no obstacles[cxxxi].

Metaphors are never perfect, but this way of looking at the conservation movement as the Wild River watershed, with different tributaries giving it strength, diversity, and nutrients, is damn good. It allows us to see that the new tributaries have not replaced the old ones. It shows that the headwater streams that initially formed the Rio Salvaje did not disappear when new tributaries flowed into it. It shows the compatibility between the “scientific” tributaries and the ascetic and recreational tributaries. And it shows how the threat of destruction gave rise to all these currents in favor of conservation.

Wilderness and biodiversity conservation are not airy romantic fantasies to recapture a mythical past of purity and goodness, but rather real, earthly efforts to self-willedly protect the earth from the harms of a growing population, from sprawling of settlements and increased mechanization.

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Petagrams ($=10^{45}$ grams) of carbon per year. *N. from t.*

[n] “Device that shoots cyanide directly into the mouth of the predator when it tries to take a bait. *N. from t.*

[o] One pound is approximately equal to 453.6 grams. *N. from t.*

⁴⁵ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

Presentation of ‘INTIMATE PLACES’

Despite being a rather superficial text and being framed in the typical current of current Deep Ecology (idealist and hippy), this text could be interesting mainly for two of the topics it touches on: the discussion about the concept of “wilderness” (a concept difficult to translate in a simple way whose meaning oscillates, depending on the case, between “completely virgin area” and “natural space”) and the idea that the personal experience of individuals determines the attitude they have towards the natural world. The author’s interpretations and conclusions regarding these two aspects are not important (in fact, they are more than debatable in many cases). The really interesting thing is that it could serve as an introduction to the two topics covered and the questions they imply. Among others: what do concepts such as “Nature”, “natural”, “wild”, etc. mean (and what not)? To what extent is experience and learning important (or not) when it comes to developing an attitude and having certain values? Are nature lovers born or made?

INTIMATE PLACES

By John Revington¹

There is a strong connection between our separation from Earth² and the damage we do to it. This is nothing new. It’s kind of obvious; It has been said on countless occasions and it is not very useful to stop lamenting our alienation and pointing out the importance of ending it. Humans are not inclined to develop intimacy with the places they inhabit just because ethically it would be okay to do so. Changes that are made solely out of a sense of duty lack authenticity and are often not sustainable. But there is a much more powerful reason to develop relationships with the land. Intimacy enriches our lives, whether it occurs with the people we meet or the places we inhabit. On the other hand, if we remain detached from the places we inhabit, our lives become impoverished in all aspects, in the same way as if we never get close to the people

¹ a) Translation by Último Reducto. *Translator’s note.*

² In English there are two words to express two different concepts that in Spanish we call only one: “land”. The planet we inhabit, “Earth”, and the territory or terrain: “land”. In this text, I have translated “Earth” as “Tierra”, with capital letters, and “land” as “tierra” with lower case. *N. from t.*

with whom we live. So this article explores the ways in which we can learn to develop intimacy with the places we know.

Culture as a barrier

To discover how we can develop a deeper connection with the places we inhabit, it will be helpful to investigate the barriers our culture erects between us and the natural world. My dictionary gives a definition of the word culture as "the sum total of ways of life created by a group of human beings, which is transmitted from one generation to another" and this is the sense in which I use the term. The culture I am talking about is the one produced by the computer you are probably using to read this. It is a culture that prevents rather than promotes intimate relationships with the places in our lives.

Is it realistic to expect people to develop a deep sense of place in our culture? Most of us are not directly dependent on where we live for our food, clothing, and shelter, and therefore our relationships, even with those places that are most familiar to us, end up being conceptual and aesthetic rather than purely emotional. If we take a broader perspective, we can see that life and death are very present. However, we know that not immediately, but on a conceptual level.

It's one thing to know intellectually that if the world's farmland runs out, a lot of people will go hungry for the next ten years; It is quite another to know that if the land I live on stops producing food, then I and my loved ones will starve. In traditional hunter-gatherer societies, every action, every moment, implies some kind of bond with the natural world, and survival depends on those bonds. In our culture this fundamental immediacy has been lost.

In this regard it is worth noting how limited ideas about saving "the planet" or "Earth" or "Gaia" are. While such ideas are useful, I think they lack the power that direct experience brings. I cannot experience the entire Earth directly. It's too big. I can only experience specific parts of the Earth. The Earth will always remain just a concept, no matter how powerful that concept is. Consequently, I believe that the strongest and most authentic motive for environmental activism is rooted more in our affection for particular parts of the Earth than in a commitment to an abstract idea of the whole of Earth. This is what Thomashow's findings, discussed below, suggest about the childhood experiences of environmental activists.

Another effect of our culture is that it physically isolates most of us from the natural world, as James Lovelock points out:

"Imagine a world in which men and women were raised separately until adulthood. This would not facilitate love relationships. The fact that the Earth is being violated rather than loved may have its origin in our unnatural urban separation from it. [Quoted by Swan, 1990, page 12].

But the separation is not only physical. When compared to indigenous people, members of our culture are at a serious disadvantage even if they are fortunate enough to live in places where the land is not covered with asphalt and concrete. Robert Greenway has been guiding wilderness outings³ for over twenty years to help people strengthen their connections to wilderness. He believes that the success of these excursions to “experience the wilderness” depends on “the extent to which we are able to leave our culture behind” (Greenway, 1995).

On the other hand, traditional hunter-gatherer societies do not need to leave their culture behind to enter into communion with Nature. Such an idea would seem extremely strange to them, since their cultures are the expression of their ties to the land. Such links are present in information about food and its procurement, totem animals, creation stories, sacred places, shelter building, dress making, and many other areas of life. In fact, it will be difficult to find any aspect of these cultures that does not refer us in some way to a link between a person and a place. In our culture, these direct connections have been supplanted by our dependence on stores, institutions, and money.

Another way our culture works against that intimacy is by making time a scarce commodity. Intimacy generally requires conversation, and as David Orr points out, “Good conversation is to be kept unhurried. It has to have its own rhythm and cadence. Dialogue with nature cannot be rushed. It must be governed by the cycles of day and night, by the seasons, by the rhythm of procreation, and by the larger compass of evolutionary and geological time. The human sense of time is increasingly frenetic, marked by clocks, computers and revolutions in transportation and communications. [Orr, page 53].

If we allow our busy lives to dictate the amount of time we can spend in natural places, then we are likely to engage in hurried monologues instead of good conversations.

Cataloging the defects of our culture is not particularly helpful if we stop there. But an understanding of the roots of our alienation is essential if we are to do anything to combat it. What our culture does is place restrictions on the ways in which we interact with the natural world and, coming to the point of this text, interaction is the key to intimacy, whether that intimacy is with the land or with the land. with other humans.

Let me use an analogy. Suppose I fell in love with a woman as soon as I saw her for the first time. Unless he was scared or, for some other reason, more inclined to observe life than to live it (he could be an Internet addict or an intellectual) he would immediately want to go from looking at her to chatting with her. If that looked good, I might want us to get into a relationship, to develop intimacy. If I were prevented

³ “Wilderness” in the original. Impossible to translate exactly in this case with a single Castilian term. “Wilderness” refers in English to areas where ecosystems are little or not at all humanized, that is, “wild areas (or lands)”. This last expression is the closest translation to the meaning of the original. In the absence of a better one and unless I make it explicit, this will be the expression that I will normally use as a translation of “wilderness” in this text. *N. from t.*

from doing those things, all I could do was look at her, admire her from afar. He might come to believe that simply by being in his presence, he had already come into contact with his spirit. But without real interaction, how could I know that what I came into contact with wasn't just my own projection? Even if she could try to maintain that contact, the first excitement of falling in love would inevitably fade. In the absence of any real experience of that woman, I would be creating fantasies about what she would be like. There would be a relationship, not between me and another person, but between me and my fantasy.

I don't want to go too far into this analogy. What I want to point out is that a relationship with a piece of land, based solely on appreciation for its visual beauty, will always remain one-dimensional. A sustainable and satisfying relationship is only possible through interaction.

The title "Intimate Places" is a cheap trick to get your attention, and since you're still reading, it seems to have worked pretty well. But the comparison between the relationships between human individuals and the relationships between humans and the earth was more than a way to catch your attention. It offers a useful way to look at our relationships with the earth and the assumptions we make about them.

In order to explore these implications a bit more deeply, I would like to briefly discuss the concepts of 'natural places', 'wildlands' and 'intermediate areas'. By "natural places", I mean those where there are a large proportion of natural species that are not under the direct control of humans. This definition is deliberately imprecise and does not refer exclusively to "wilderness" areas, which I consider to be areas where overt human intervention is minimal. Areas that are natural but not wilderness I have called "intermediate areas".

In general, we learn to relate to our environment through interaction, just as we get to know people through interaction with them. In other words, we test our knowledge and understanding through action, and any further action will be determined in part by how the environment responds to that action. This is true whether we are talking about how children learn to walk, how two adults learn to relate to each other in mutually satisfying ways, or how someone learns to use the Internet.

Is wild nature⁴ a story?

When it comes to wilderness, however, interaction seems to be discouraged, as Steven Van Matre points out:

"It is a sad irony that many of the institutions that should be countering such [alienating] views (parks, reserves, nature interpretation centers) have become so jealous about the number of visitors they receive that they are often perpetuating unconsciously the separation of people from the natural world around them. A huge number

⁴ "Wilderness" in the original. In this case, the expression "wild nature" seemed better to me for reasons of style. *N. from t.*

of signs („Do not leave the road’, „No collecting’, „Keep distance’, „No running’, „Do not touch’) have become the usual solutions to control visitors nowadays” . [Van Matre, 1979, page 7].

By definition, a place is not considered "wild" unless the amount of human impact on it is negligible. So when we enter a protected natural area⁵, our relationship is usually reduced to passive observation. Although we can walk or row through it or camp in it, I think there is a fundamental difference between this type of relationship and the relationships that usually develop in a normal context. Going back to our analogy, one could argue that simply admiring a picturesque landscape is a bit like looking at the Playboy magazine centerfold. In neither case does the observer have a satisfactory relationship with the object of his admiration. Making love to a place or person requires intimate knowledge and requires interaction rather than passive observation.

The very concept of wilderness as places where humans have had no impact does not hold up to closer scrutiny. A popular anti-environment bumper sticker for car windows proclaims that "the only truly wilderness⁶ is between an environmentalist's ears." There is more to this statement than most environmentalists would admit, since wilderness as most people understand it is more of a concept than a reality. The idea of wild lands understood as "untouched" has been denied by many authors, including Aboriginal academic Marcia Langton, who points out that the so-called wild lands "have been inhabited and used by indigenous people for thousands of years". [Langton, 1996, page 16].

Therefore, the difference between wilderness and non-wildness is false, and the same forces operate on both sides (a fact that humans ignore and endanger themselves. I am not denying that such a distinction is useful, in fact it is essential. . But it is also useful to realize that such a distinction is ultimately non-existent. Humans are subject to the same limits and processes as other creatures, and the idea that we are something apart negates that evidence.)

I am not suggesting that since the notion of 'wilderness' is based on a false duality, it should be sold to developers. Given the predatory nature of our relationship with the Earth, it is essential that these areas remain intact. What I want to emphasize here is that our relationship with these areas is limited, and therefore they should not be the only areas in which we look for a connection with the natural world.

The places where humans have impacted nature are vitally important because we have the ability to interact with them in ways that we cannot in the wild. It is our relationship with these places that I would like to discuss next.

⁵ "Wilderness" in the original. In this case I think this translation is more appropriate. *N. from t.*

⁶ "Wilderness" in the original. In this case, the most appropriate translation is "deserted natural area", alluding to the fact that, at least in Anglo-Saxon countries, wild areas are usually considered uninhabited or empty. *N. from t.*

Intermediate areas

Eshana has tested the hypothesis that “experience of natural environments is more beneficial for psychological health than experience of human-made environments” [Bragg, 1992, page 53]. This author has examined the responses of various study subjects to three types of environment: a city street, a suburban park, and “open woods and meadows with views of nearby wetlands and hills” [*Ibid.*, page 70].

As the author points out, the results do not support the idea that the more natural the environment, the greater the psychological benefits:

An unexpected result was that the environment with an intermediate degree of “naturalness” (the suburban park) produced the most positive responses. The hypothesis that short-term psychological benefits increase as one moves down the gradient from “human-influenced environments to natural environments” did not hold [*Ibid.*, page 80].

I would say that one of the reasons the study subjects benefited more from contact with the park than from contact with wilderness⁷ is that they were able to interact more fully with the park, or that at least they could see evidence of such interaction. Being actively involved is somehow more satisfying than just passive observation.

Since traditional Aboriginal Australians have an intimate interactive relationship with their environment, and since their culture encourages rather than hinders such relationships, it will be useful to consider their experience.

In the words of the great anthropologist, WE Stanner, Aboriginal people before the white encroachment did not move “in a landscape, but in a humanized space saturated with meaning” [Rose, 1996, page 18]. Their world was not a wilderness, in the sense that it was far from untouched by humans. Rather than worshiping the land from afar, Aboriginal people had a deeply intimate relationship with their country.

As Deborah Rose points out, pre-invasion Aboriginal people were not shy about having an impact on the land:

“There is no place on this continent where the feet of aboriginal humanity have not preceded those of the settlers. Nor is there anywhere where the countryside was not once worked and kept in a productive state by the land management practices of Aboriginal people [Rose, 1996, page 18].

”It is not possible to say with certainty,” says Rose, “that the land management practices of Aboriginal people, especially their meticulous use of fire, were not responsible for the long-term productivity and biodiversity of this continent.” As well as management through the use of fire, the aborigines practiced selective harvesting and extensive organization of reserves, and also promoted the regeneration of plants and animals” [*Ibid.*, page 10].

⁷ “Wilderness” in the original. In this case I have translated it as “wild environment”. *N. from t.*

The relationship went far beyond the merely practical. To use Stanner's expression, the field was "saturated with meanings" that involved much more than resource management. For traditional Aboriginal culture, "tribal land had sacred origins, sacred and dangerous places, sources of life and places of death" [*Ibid.*, page 9]. The key aspects of this relationship, therefore, were management, intimacy, regular interaction, and sacredness. It is interesting to compare these with those factors identified as necessary for effective environmental education by Van Matre. I will deal with Van Matre's work a little further down.

Interaction with intermediate environments offers other advantages when it comes to strengthening our relationship with the Earth. There is no doubt that the wilderness experience can bring many people a deep connection that is otherwise unattainable. But few people can go to a wild place every week, and if everyone could, the huge numbers of visitors such places would receive would make them not so wild.

As Greenway [1995, p. 133] points out, "it is key to learn how to maintain, or integrate, knowledge gained in the wilderness when re-living in our 'culture'". Intermediate environments could offer means to achieve this, and their accessibility is one of their greatest advantages. Cahalan [1995, page 217] points out that "producing food and cultivating the land can be fundamental aspects of the experience" of maintaining contact with natural processes.

I would now like to discuss childhood experiences of place, because these are one of the especially significant types of interaction.

Childhood connections to a place

The experiences of our childhood are of great importance for the development of a connection with concrete places. Thomashow [1995, page 12] argues that childhood memories of certain places need to be explored in order to "become aware of the connections we make with the land⁸, awakening and maintaining those memories in our notion of the present". Thomashow indicates that several theorists, including Joseph Chilton Pearce, Roger Hart, Edith Cobb, and Paul Shepard, believe that the period of childhood between the ages of nine and twelve is the most important in the formation of such connections. These childhood memories, says Thomashow, offer us an "idealized version of what it feels like to be attached to a place" [*Ibid.*, page 12].

The importance of childhood connections in shaping our relationship to certain places, and thus to ecological concerns in general, is powerfully shown by Thomashow's observations of environmental activists from many countries with whom he worked during a period of more than fifteen years:

⁸ In this case "earth" in the original. I have translated it as "earth" because it was written in lower case in the original. I suppose that the author refers, anyway, to "Earth" ("Earth" as a planet) and not to "land" ("earth" as "territory"). *N. from t.*

“ Despite the variety of international and cultural experiences, there is a striking common thematic pattern, they all tell a similar story. They have fond memories of a special place from childhood, formed through their connection to the land⁹ through some kind of emotional experience, which is the basis of their attachment to the land or to their immediate neighborhood community. It is very common for these to be memories of play experiences, involving exploration, discovery, imagination, adventure, independence, and even danger. And what remains is the quality of the full descriptions of the vividly portrayed landscape that permeates his memories [Thomashow, page 9].

To see what conditions best promote the formation of childhood connections to certain places, I turn to Stephen Van Matre’s writings on environmental education. Van Matre has written extensively about what it takes for children to experience the natural world in a way that is challenging and meaningful to them. Although environmental education and our development of connections to place are not identical processes, they do have much in common. Van Matre’s work is therefore a valuable guide to what is needed for the early formation of important connections to place.

Overcoming taboos against touching things imposed by parents is one of the priorities, Van Matre. He has discovered that “many kids approach nature¹⁰ as if they were encapsulated in plastic bubbles, isolated from contact with the stickiness of life by a series of prohibitions: Don’t get dirty! Don’t put that in your mouth! Do not wet yourself! Be careful not to damage the clothes! In short, life for many kids is something you look at but don’t touch” [Van Matre, page 7].

One of Van Matre’s premises is that “people learn better when they feel what they are learning” [*Ibid.*, page 9]. I’m not sure if “feel” means “touch” or “experience an emotion” or both. It is probably no accident that the word “feel” has a double meaning. The connections between touching and experiencing emotions could be a productive research topic.

Solitude is highly valued by Van Matre as something that “promotes the acquisition of non-verbal skills such as waiting, observing and receiving. It sharpens awareness and reinforces the feeling of harmony with the world around us. It helps us understand what is happening to us, or simply gives us time to „be’ and „be’¹¹” [*Ibid.*, page 9]. In our culture, solitude is often undervalued and hard to come by.

Collaboration is also important. As important as loneliness, according to Van Matre. He writes “people of all ages respond better if they can participate in something than if it is just shown to them”. Learning theorists have emphasized that self-directed learning is the most effective. Van Matre agrees: “The best learning experiences begin

⁹ See note 9. *N. from t.*

¹⁰ “Out-of-doors” in the original. The expression “out-of-doors”, or “outdoors”, literally “doors outside”, refers to spaces located in the open air, and generally relatively “natural” (parks and gardens, at least). In this case, for lack of a better term, I have translated it as “nature” *N. from t.*

¹¹ “To be” in the original. In English “be” can mean “to be” or “to be” depending on the context. I have translated it as “ser y estar” since I consider that in this case it could mean both. *N. from t.*

where the learner is, not where the teacher is, and it is the experience, not the teacher, that is the best teacher.”

Another aspect of learning about the environment that Van Matre emphasizes is the importance of daily contact “with the elements of life” since it “refreshes our sensation of being and being¹² and renews our certainty that we are becoming part her¹³” [*Ibid.*, page 9].

And finally, Van Matre sees that a magical sensation is indispensable. “In a good learning experience,” he says, “the medium should be the magic of discovery, wonder, and joy” [*Ibid.*, page 9]. He doesn’t try to define “magic”, neither will I. Whatever it is, I think it can be seen as an intrinsic quality of everything that exists. The magical sensation is despised by the most reductionist science, and finds its expression in the myths and sacredness that abound so much in indigenous cultures [...]

[...]

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¹² See note 12. *N. from t.*

¹³ “Becoming”, simply, in the original. Literally ”becoming”, ”transforming into”, ”becoming” or

Deep Confusion In Intimate Places

(Some comments on the article “Intimate Places”. By AQ).

Indeed, this article addresses some issues that are enormously important to those of us who consider the autonomy of Wilderness our fundamental value and want to do what we can to defend it. Some examples of this would be: the influence of education/learning on the moral values of the individual, the influence of progressive ideologies on the development of the material factors of modern industrial society, the importance of science and rationality in the defense of wild Nature, whether or not wild ecosystems exist wherever human beings inhabit and the confusion between modifying the environment and managing it. However, the conclusions reached by Revington (or whoever wrote this article) could hardly be more wrong and misleading in most of these cases. If this article can be taken as a sample of the values and motivations of those individuals framed within the current “Deep Ecology”, and taking into account that for many, within environmentalism, this is the ideological current that promotes more radical changes in favor of wild nature, we’re done. Let’s look at some reasons why:

To begin with, the article is based on an idealistic (not materialistic) approach to reality. It seems to assume that it is ideas, thought... that generate the material circumstances under which individuals live. The conclusion that some of us reach when analyzing reality is just the opposite: that it is the material conditions that, in the long term and on a large scale, determine which values or ideas can be extended and which cannot.

It seems that for Revington the root of the problems that the natural world currently suffers lies in culture as an expression of human ideas and thought (despite his own definition of culture) and not in the industrial technological system as a physical entity. If it isn’t (and I’m afraid it is), it should at least have been more clearly stated. It does not seem to take into account that said technological system has autonomous operating patterns, that is, independent of human interests. Nor that, precisely because of these autonomous operating patterns, certain ideas (some of which are very well pointed out by Revington in his article), have spread and become popular among the population of the techno-industrial society. Any social system generates an ideology that justifies it and favors its stability; and today’s society is not exactly an exception. But, from there to consider that it is the ideas that generate the material circumstances, there is an inversion of causes and effects that should not be carried out if the large scales of time and space are taken into account.

Let's see it more clearly with an example: The author of *Intimate Places* (LI) states that "if we allow our busy lives to dictate the amount of time we can spend in natural places, then we will engage in hasty monologues instead of good conversations". This phrase gives rise to the idea that "everything is in the mind", that is, if we mentalize ourselves, we can dedicate the time we want to Nature despite living within the techno-industrial society. Nothing could be further from the truth: this society forces the individual in a thousand ways to dedicate a good part of his time to collaborating with it (for example, through a job) and, furthermore, today many of the innate needs and tendencies of the individual can be satisfied or developed more effectively (although it is not the truly adequate way) in the artificial environments created by the techno-industrial society than in the natural spaces that still remain (mainly because the latter are scarce and their use is increasingly restricted). Therefore, in practice, most individuals tend to spend most of their time in highly humanized places, whether or not they have values of respect for wild Nature. This paradoxical reality does not depend on the will of the individual, but is marked by the material circumstances that surround him and by his own biology.

Perhaps due to this idealistic approach, the author of LI seems to believe that all or most of the population of today's techno-industrial society can change their valuation of Wild Nature through psychological, propagandistic and legislative techniques (what the article refers to) . called "environmental education"). Here there would be another mistake: forgetting that the bases of human behavior (and with it of moral values) are innate, not cultural. Individuals have innate tendencies and capacities created by evolution by natural selection, that is, a nature. Therefore, psychological techniques, no matter how sophisticated they may be, cannot transform the individual's behavior in a lasting and effective way beyond certain limits set by our nature.

Those individuals who, throughout their lives, have never tended to value wild Nature and all that it entails (individual autonomy, effort, toughness, aggressiveness.) are hardly going to change their assessment by being subjected to some program of "environmental brainwashing. It may be that, through some kind of coercion (physical and/or psychological), a large part of the individuals in a society publicly manifested a "positive assessment of Wild Nature" and tried to behave in accordance with what society demanded of them. them for a mere matter of convenience. But, be that as it may, that would be far from being a sincere positive assessment of Wild Nature. There would be no true devotion to Wilderness (not to mention the freedom individuals would enjoy in a society that had to force them to "value Wilderness"). Therefore, a very powerful coercive apparatus would be necessary to ensure that said society was perpetuated over time. In other words: it would be necessary to maintain most of what has caused the most damage to wild Nature: the industrial technological system.

Even if we limit ourselves to the first stages of life (childhood and adolescence), moments in which, a priori, the individual is more innately open to making changes in their behavior, the scope of educational and propagandistic techniques remains limited. . Revington (relying on the studies of others he cites) seems to have found a connection

between experiences in nature during childhood and environmental attitudes, but he forgets a scientific principle when it comes to proving something: relationship does not necessarily imply causality. Surely the reader will know many cases in which, having had an individual direct relationship with Nature during his childhood (excursions, camping, workshops in the field or in the mountains...) he has not subsequently developed values of respect towards nature. wild, not even to the rural world. In addition, from this supposed connection, the opposite conclusion could be drawn: individuals with environmentalist attitudes could have this tendency innately and, therefore, it is normal for them to show signs of it from childhood. But causality would not be proven in any of the cases. Therefore, based only on this supposed relationship between childhood experiences and environmental attitudes, Revington should not jump to the conclusion that education is key to developing values of respect for the natural and wild world. It may not even matter much.

Lovelock's quote is another example of this "forgetting" about human biology. It may be that some humans raised separately from members of the opposite sex had some more difficulty relating to each other as adults, but if Lovelock had taken more into account that the bases of human communication and sexuality are innate, he would not I would not have set such an example nor would I think in the same way about the values of respect for Nature (that these can be "learned" during childhood). If underestimating the influence of human biology on their ideas were something punctual, the errors in this regard by Lovelock and Revington would not go beyond the merely anecdotal. But unfortunately, from what I have seen so far, this is a constant within environmentalism (at least in Europe).

Indeed, the last sentence of Lovelock's quote and a few of Revington's statements in his article implicitly suggest that early humans, simply because they lived in more direct contact with Nature, possessed a heightened consciousness. ecological than civilized humans, which is, at least in some cases, more than questionable based on the available ethnographic and archaeological information. (I hope that the myth of the "primitive conscientious environmentalist" and, more generally, the idealization of primitive societies will be dealt with in greater depth in other texts on this page in the future.)

Another point worth mentioning in this article is the rejection that the author of LI seems to experience for science and rationality, something common within countercultural hippies. I have argued before that Revington had set aside a scientific rule (relationship does not necessarily imply causation) when drawing conclusions, and that he does not seem to take much into account either materialism or human biology in his arguments. And he goes so far as to affirm, right in the last sentence, that science is "reductionist" because it despises the "magical sensation". It may be that scientific interpretations of reality do not always fully conform to it (among other things because knowledge always has limits), but some, like me, are convinced that science (the official one, not esoteric pseudosciences, "hidden", etc.) is the most effective means (the most realistic and reliable) available to us to understand the functioning of the

techno-industrial society and develop a movement against it. In the same way that I am convinced that we cannot aspire to understand reality and effectively combat a social system as complex as the techno-industrial one by means of magic and spirits (no matter how much primitive societies used these means to try to understand reality). The hippy-countercultural rejection of science and rationality is motivated more by its need to reject established culture (some of the scientific applications are a key element in the development of modern society) than by a true rational argumentative basis.

Another important aspect related to the above is the way of expressing yourself publicly. The author of LI may be simply using metaphors, poetry and other stylistic devices, but some of his expressions are pure metaphysics, more typical of a nutcase than a sane person: “conversing with Nature”, “getting in touch with your spirit”, “make love with a place”. Perhaps the author of LI is aware that these expressions are metaphors and does not believe them at face value, but he does not seem to be aware that on many occasions the same does not happen with the reader or listener: sometimes he literally believes in said words. expressions and feels identified with the words of those who express themselves in this way. For this reason, Revington and all those who intend to do something effective in favor of Wild Nature should think, before intervening publicly, what kind of people they want to attract with their speech and which ones to distance. Revington, with its rejection of science and rationality, its attachment to magic, and its metaphorical expressions is not exactly going to appeal to rational and serious individuals... but to hippies, leftists, kooks, and other people who an anti-science movement techno-industrial society should keep away from each other.

One of the key points of this article is the debate about whether or not wild ecosystems exist where human beings live and the confusion between modifying and managing the environment. The author of LI, it seems that trying to defend the importance of the wild, affirms that primitive cultures already managed the ecosystems they inhabited. This statement is sometimes used by those who defend technological development to argue that since all human societies manage their environment, there is nothing wrong with modern industrial civilization doing so. Therefore, it would be important to analyze whether Revington’s statement is true and, on the other hand, whether the apparent logic used to justify technological development really is.

It is quite evident that the modifications that the techno-industrial society has generated in the ecosystems have a scale and intensity far superior to the modifications that could be carried out not only by primitive cultures, but also by any pre-industrial civilization. But, in addition, with respect to primitive societies and especially nomadic hunter-gatherer cultures, the difference is not only one of degree, but of quality. Can we speak of “environmental management” when there is neither voluntary action nor large-scale planning? Being a constituent element of an ecosystem (albeit influential and important) is not the same as managing large territories from the outside. For example, we know that the large African herbivores are largely responsible for the appearance of the African savannah, since with their activities they clear and open clearings in

the ecosystem, prevent the growth of saplings, etc. Would it occur to someone with half a brain to say that large African herbivores manage their environment? Surely not to many, because we realize that having an impact on an ecosystem (even a notable one) is not the same as large-scale voluntary planning (transcending a multitude of ecological limits to which other species are subject), as as can a modern state forest service. Which of these two things are the modifications of the environment generated by primitive cultures more like? There may be some question as to whether early humans acted in exactly the same way as other animals, such as the large African herbivores in the example. But what is clear is that you have to have very little judgment or ideological motives (justify the management of ecosystems by the techno-industrial society) to call by the same name ("management") what they could do with their environment. primitive cultures and the tremendous and continuous (and planned in many cases) modifications in a large part of the ecosystems of planet Earth by modern industrial civilization. And this is true no matter how much some aborigines have become "academicians" and say that their ancestors already managed ecosystems. stupidity is not just a white man thing.

More importantly, regardless of whether or not there is any human way of life that can be fully integrated into wild ecosystems, of all existing human cultures, nomadic hunter-gatherer ways of life are those that, because of their simplicity and small size, , they may have less impact on wild ecosystems and may become more in tune with human nature. And, in fact, it usually has been. It is precisely for this reason that some of us take these ways of life, and not others, as the social ideal of reference.

In conclusion, a movement against the techno-industrial society that claims to be truly effective should be materialistic, scientific, rational, and keep away from its ideas and activities not only progressivism, but also humanism, leftism, and hippism. Revington in this article is not in most cases materialistic, scientific, or rational, and his ideas seem to be significantly influenced by some humanist values of civilization, especially by the so-called "counterculture." I have not read everything said by the defenders of "Deep Ecology" and, certainly, I share more values with this current than with the majority of European environmentalism (at least it is an ecocentric current, not like the majority of European environmentalism), without However, based on what I have seen so far (the principles listed by Arne Naess, an article by George Sessions, this one by Revington, and an article that turned out to be focused on self-help) I would say that the depths of "Deep Ecology" It is not its ecology, but its confusion.

Presentation of "AGAINST THE SOCIAL CONSTRUCTION OF WILD NATURE"

It is not the first time that we have published an article on this page about postmodern attacks against the notion of the wild (see, for example, the articles "The Authentic Idea of Wild Nature" or "The wild, cyborgs and our future ecological"). Even so, we consider that the following text also deserves to be published and read.

The main peculiarity of this article in particular is its double approach, on the one hand theoretical-philosophical and on the other practical-political. The philosophical part basically focuses on exposing the intellectual dishonesty and anthropocentrism on which postmodern arguments are based that defend that "the wild" is a mere social construction, a cultural invention that does not exist in reality and has no value in reality. herself. Throughout the text, the author discusses and refutes, generally quite correctly, many of the arguments and fallacies that postmodern humanists often use to try to devalue and dismantle the notion of the wild as a fundamental value: the assumption of that everything is culturally and socially relative, except postmodernism itself, of course; as well as the underlying humanistic idea that the only thing important, the only thing valuable, and even the only thing that exists are human affairs, not Nature.

In the same way, the article shows how the postmodern position has serious political implications, since, in the words of the same author, "the constructivist point of view does not take scientific documentation on the biodiversity crisis seriously; diverts attention towards discourses about the environmental problem instead of examining the problem itself; and indirectly takes advantage of it and, therefore, supports the human colonization of the Earth".

In addition, the article is also interesting because, albeit glancingly, it touches on some of the underlying philosophical and practical problems that are typical of perspectives that take the wild as a central value: the alleged human-Nature dualism; the value of science as a source of knowledge; the existence of an intrinsic value in Nature; etc. Those who claim to defend the autonomy of Wild Nature should be aware of them to avoid superficiality, inconsistency and theoretical naivety.

AGAINST THE SOCIAL CONSTRUCTION OF WILD NATURE[i,ii]

By Eileen Crist

INTRODUCTION

The postmodern constructivist perspective on nature holds that cultural, economic, political, linguistic, scientific, and other practices shape the meanings of *nature* and *wildness*. For constructivists, such practices are inescapably implicit in all perceptions and appraisals of the natural world. They assert that there are no unmediated representations of nature, since all of them are anchored in social contexts—contexts indelibly inscribed in the modes of knowledge that generate such representations.¹²

Constructivism considers it axiomatic that the intrinsic meaning of natural phenomena is non-existent and that it is human material and semiotic work that gives them meaning. Since interpretive and practical work is essentially social, constructivists hold that sociocultural factors—economic conditions, political circumstances, paradigms, interests, networks, discursive practices, and the like—can explain the emergence and character of beliefs, including true beliefs, about nature. Given that all beliefs are explained by sociocultural factors, the constructivist position implies a certain degree of epistemological relativism—beliefs are not immutable or universal, but relative to the places and times in which they occur. In the words of Phil Macnaghten and John Urry, “there is no single ‘nature’, only natures. And those natures are not inherent to the physical world but are constructed discursively through economic, political and cultural processes”.³

This article is a critique of the way postmodern constructivism views nature. As Ian Hacking has pointed out, many things and ideas are said to have been socially constructed—from “gender” and “language”⁴, to “quarks” and “reality”. Constructivism covers a wide and heterogeneous field of study. My intention, here, is not to talk about constructivism simply, but to specifically criticize its application to “nature” and “the wild”. By “postmodern constructivism,” I mean studies that show evidence of the following: emphasizing cultural ideas, narratives, power constellations, politics, and the

¹ “Wilderness” in the original. A term that is difficult to translate into Spanish, it refers to ecosystems or territories with little or no humanization, that is, wild. However, depending on the context it may be convenient to translate it differently as “wild ecosystem”, “wild land” or even “wild nature”. In this text, unless otherwise specified, it has been translated as “the wild.” *N. of t.*

² Translation of “Against the Social Construction of Nature and Wilderness”, by Último Reducto. Original published in *Environmental Ethics*, vol. 26 (Spring 2004), pages 5-24. *N. of t.*

³ Original title: *The Vanishing face of Gaia*.

⁴ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity*.

like as the primary driving forces behind the creation of knowledge; reject that there are foundations for knowledge that transcend sociocultural contexts; the epistemological predilection for the relativization and pluralization of “knowledge” —underlining its contingency and diversity; and skepticism towards “canonical knowledge”⁵] and/or the “dominant narrative”^{6, 7}.

Although in principle the idea that knowledge is socio-historically relative seems trivially true, delving into the assumptions and implications of the “social construction of nature” reveals that it is intellectually narrow-minded and politically difficult to accept. Despite their predilection for uncovering the sociocultural roots of representations, “nature” and “wilderness” constructivists do not deconstruct their own rhetoric and underlying assumptions to consider what fuels the credibility that social constructivism has. gathers under the denomination “configuration of knowledge/power”^{8, 9}. I argue that the latest applications of social constructivism to environmental issues reflect the stubbornness of anthropocentrism and support the attempt to humanize the Earth. As an intellectual mirror of such trends, constructivism functions as an ideology—and is, as biologist Michael Soulé has pointed out, as dangerous to the goals of conservation, preservation, and restoration of natural systems as bulldozers and chainsaws. ¹⁰

⁵ “Literacy” in the original. In principle, the term “literacy” means “literacy”, but in certain contexts it is used as the ability to use language, numbers, images, etc. Given that the supposed cultural character of the ability to use language is one of the topics preferred by postmodernists, “literacy” has been loosely translated as “language”, in this case. Perhaps another possibility would be to translate it as “knowledge”, since in this society literacy and knowledge are frequently identified. *N. from t.*

⁶ “Master narrative” in the original. *N. from t.*

⁷ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁸ “Knowledge/power configuration”, in the original. *N. from t.*

⁹ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

¹⁰ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

Presentation of “WHERE IS EARTH FIRST HEADING!?”

In the review of the book *Earth First! Environmental Apocalypse* by George Sessions [<http://www.naturalezaindomita.com/resenas/earth-first-environmental-apocalypse>][<http://www.naturalezaindomita.com/resenas/earth-first-environmental-apocalypse>], reviewed and featured a brief history of Earth First! (EF!) in its beginnings. This time we include an article by one of its founders, Dave Foreman, written at a crucial time for that radical environmental group. This can help us better understand both the initial philosophy of EF! as the operating approaches that facilitated the replacement of the main and original ideas and objective of this group by leftist discourses and objectives. In fact, this article is, at bottom, a kind invitation to many leftists who had been involved in Earth First! leave this group. It must not have been of much use, since it was the author himself, along with many people related to him, who abandoned EF! three years after writing it.

We will leave for [<https://sites.google.com/site/indomitismo/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/de-cmo-la-tierra-dej-de-ser-lo-first>][another article]analysis of the process that led to EF! to be engulfed by leftism. Some of the clues, however, can already be found in Foreman’s article. The EF! Initially, it suffered from an embarrassment of diversity and tolerance in its ranks. By the time some founding members like Foreman figured it out, it was too late. The refusal to maintain a well-structured and defined organization, the preponderance given to radical activism in the form of ecosabotage, the flirtations with neopaganism or the assumption that diversity was useful resulted in the erosion and substitution of the principles of this group summarized in the motto “Earth First!” (or “The Earth is the First!”, precisely that means Earth First! in English). In the [<https://sites.google.com/site/indomism/reviews/earth-first-environmental-apocalypse>][review by George][<https://sites.google.com/site/indomism/reviews/earth-first-environmental-apocalypse>][Sessions]from the book *EF!: Environmental Apocalypse* [<http://www.naturalezaindomita.com/resenas/earth-first-environmental-apocalypse>][<http://www.naturalezaindomita.com/resenas/earth-first-environmental-apocalypse>], we saw that the social justice faction had managed to make its “environmentalist” goals prevail, leaving aside the protection of wilderness areas and the defense of the ecological integrity of the Earth (which was the core of EF!’s philosophy at the beginning). Phew! From the beginning, it had its

own newspaper in which these ideas were vindicated and explained, and that was not enough to preserve them. This lesson must be kept in mind.

As for the philosophy and positions exposed by Foreman, broken down into the 15 points of the article, much could be said. What were your successes? What are your faults? The depth of Deep Ecology, is it its confusion, as AQ wrote in its criticism of "Intimate Places" [[http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-](http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-techno-industrial/profound-confusion-in-intimate-places)]

[<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/confusin-profunda-en-lugares-ntimos>][[tecnoindustrial/confusin-profunda-en-lugares-intimate](http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/confusin-profunda-en-lugares-intimate)]]? Is it necessary to insist on the ethical positions of lifestyles and activism to achieve an effective opposition to the development of this civilization? What is the priority: conserve wild Nature or destroy the techno-industrial society?

WHERE IS EARTH FIRST HEADING!?!¹

By Dave Foreman

A hallmark of Earth First! since its inception has been the acceptance of diversity within our movement. Just as a diverse ecosystem is more stable, many of us have argued that a diverse social movement is stronger. However, while diversity can strengthen and stabilize our tribe, too much diversity can fracture and immobilize it. As in any action-oriented group, there needs to be basic agreement on certain issues of ideology, strategy, tactics, and style, otherwise any attempt to do something degenerates into disagreement on fundamentals. For example, I don't think anyone would argue that advocates of clearing old growth forests² or removing grizzly bears from Yellowstone³ should be accepted into Earth First!. Those matters have been decided within our tribe. We could discuss how to preserve mature forests or grizzly bears, but not whether we should.

After seven years, I am proud of our diverse and courageous tribe. We have achieved a lot (although much more remains to be achieved). We have made old-growth forests and tropical rainforests matters of national concern, and have significantly helped

¹ Translated from "Whither Earth First!?", *Earth First! Journal*, vol. 8, no. 1 (1987) by JH *Translator's note*.

² In the original "old growth forests", referring to forests of considerable longevity where the forest management techniques used by human societies today are absent. It can also be translated as "primary forest", or even "virgin forest", but the expression "mature forests" has been chosen to reflect in this case the importance of the natural growth processes that occur in forests not managed by the human (for example, old living trees, dead trees, or abundant decaying plant matter on the ground). *N. from t.*

³ United States National Park created in 1872, the first in the world. It is found in the northwest of the country, in the Rocky Mountains, in the states of Wyoming, Idaho and Montana. *N. from t.*

create the issues of Biodiversity and Wilderness Restoration⁴, as well as promoting the philosophy of Ecology Deep⁵. We have effectively introduced non-violent civil disobedience into the wilderness preservation repertoire. And we have restructured the conservation spectrum. Our diversity in skills, lifestyles, talents, personalities, and even ideas explains much of what we have accomplished. However, I am worried because, given the increase in our visibility, given the fact that we are a “hot” group, given that we attract a lot of new people, maybe Earth First! has become too diverse, so much so that there are disagreements over matters of philosophy and style that threaten to compromise the principles of Earth First! or make us powerless. There are very powerful attempts, both inside and outside of Earth First!, to moderate us, soften us up and make our views harmless. Much pressure is being directed at our biocentric philosophy, with calls for us to become more humanistic.

I think it is time to reassess where we have come from, where we are and where we are going. What are the defining characteristics of Earth First!? What is it that essentially makes us Earth First!?

In the following paragraphs I will express forcefully and clearly (at least I hope so) my response to the above questions. As the founder of Earth First!, as the editor of this newspaper, I obviously have very strong views on these issues. But, before presenting my point of view, let me explain that the following is not the “official” position of Earth First! (whatever that is). It is not etched in rock. I believe - and I emphasize the *believe* - that what I am about to present represents the prevailing consensus of the tribe of Earth First!

If this is the case, if the defining characteristics of Earth First! that I am stating are indeed those, so I suggest that those who have strongly disapproved of them find a place for their activism elsewhere. Start your own radical environmental group. This newspaper will be happy to announce the formation of such groups and facilitate initial communication between interested people. If some people break away from this tribe to form their own tribe, there is no need for bad feelings. There’s more than enough room out there for a dozen militant environmental groups plus Earth First! And the problems we face in common run so deep that we should cooperate in a spirit of camaraderie wherever we can.

On the other hand, if I’m not in the mainstream of what is now the Earth First! movement, I want to know. I can assure you all that I will be happy to leave along with some other “eco-brutalists” (to use the invaluable term coined by Murray Bookchin⁶) and I will not hold any grudges. I just don’t want to go to my tribe’s annual meeting and listen to discussions in the workshops about whether or not there is a problem with overpopulation, or hear Ed being wildly accused

⁴ “Wilderness” in the original. *N. from t.*

⁵ “Deep Ecology” in the original. *N. from t.*

⁶ Murray Bookchin (1921-2006) American intellectual, promoter and defender of the so-called “social ecology”. Also a defender of some form of human progress and civilization and an enemy of Deep Ecology, he was involved in bitter debates with several supporters of this philosophy. (*T.N.*)

Abbey⁷ of “racist” and “fascist”. I can tolerate and respect other points of view. I can cooperate on certain points with those who hold positions that differ from mine on other issues. I just expect that same tolerance and respect.

Before offering my thoughts on the parameters that unite Earth First!, I think it is useful to briefly consider its genesis and our relationship to other alternative movements in modern society.

Neither Earth First! nor we are part of the reformist environmental movement, the animal rights movement, the anarchist movement, the peace movement, the social justice movement, the anti-nuclear movement, the non-violence movement, of the Rainbow Tribe⁸, of the neopagan movement, of the movement for the rights of indigenous people, of the Green movement or of the Left. We have varying degrees of affinity and coincide in part with all of them, but we are neither wholly contained in any of them nor do we contain any of them. We are the Earth First movement! As such, we are not even the entire radical environmental movement or the entire Deep Ecology movement. There is a lot of room for the radical wing of the Sierra Club⁹ within the conservation cause, much more than Greenpeace, Sea Shepherd¹⁰ and Earth First! can occupy. Yes Earth First! try to extend too much into the “radical environmental movement”, we will fail to our regret.

We did not emerge from the anarchist movement or from the Left. EarthFirst! It came directly out of the public lands conservation movement—the Sierra Club, Friends of the Earth¹¹, and The Wilderness Society¹². It is the issues of public domains and wilderness¹³ that have been central to us since our formation. Certainly people have come to Earth First! from other movements, some members of Earth First! have primary connections to those moves, and EF! cooperates with them on many issues, but we must remember where we came from and what our main trend has been.

In charting the future course of the Earth First! movement, in answering the question “where is Earth First! headed?”, let me elaborate on some general, albeit basic,

⁷ Edward P. Abbey (1927-1989) American writer and essayist. His work *The Monkey Wrench Gang* (1975) inspired the radical environmental movement in the US, especially Earth First! in his early years. *N. from t.*

⁸ The “Rainbow Tribe” or the Family of the Rainbow of the Living Light is an indefinite organization that emerged from hippieism that since 1972 has held annual meetings. His creed seeks peace, equality and spirituality. *N. from t.*

⁹ The Sierra Club is an environmental organization in the United States founded in 1892. Its first president was John Muir, a well-known American conservationist. *N. from t.*

¹⁰ The Sea Shepherd Conservation Society is a US environmental organization founded in 1977 by Paul Watson (a former member of Greenpeace). It is dedicated to maritime conservation and is noted for its direct action tactics. *N. from t.*

¹¹ Friends of the Earth is an international network of environmental organizations. It was originally founded in 1969 in the United States by people who left the Sierra Club. *N. from t.*

¹² The Wilderness Society is a conservation organization created in 1935. One of its founding members was Aldo Leopold (1887-1948), a well-known American conservationist and writer who popularized the idea of an Earth ethic. *N. from t.*

¹³ “Wilderness” in the original. *N. from t.*

parameters that I believe Earth First! and that differentiate us from other movements with which we share some things. Although I have already expressed these generalities in “Around the Campfire”¹⁴ and in the Round River Gatherings¹⁵ of 1987, it is necessary to discuss them in more detail to make my exposition intelligible and unambiguous. This is a healthy discussion, but it is a exhausting and distracting discussion. Let’s solve it and continue with the authentic and close work.

I think the following points define “Earth First!”:

- **Putting the Earth first in all decisions, even ahead of human welfare if necessary.** Our movement is called “Earth First!”, not “People First! ”. Sometimes what appears to be in the short-term interests of human beings as a whole, or a select group of humans or individuals, is detrimental in the short or long term to the health of the biosphere (and often even to the health of the biosphere). the real well-being of human beings in the long term). This is not to say that we should preserve natural diversity only if we can do so in such a way that it does not have a negative impact on the material “standard of living” of a group of human beings. It simply means that we should preserve natural diversity. Human beings have to adapt to the planet; it is supreme arrogance to expect the planet and everything on it to accommodate the trivial demands of humans. In everything we do, the primary consideration should be the long-term health and natural diversity of the Earth. This done, we can consider the welfare of humans. We should be kind, compassionate and care about other people, but the Earth comes first.

- **The refusal to use human beings as the measure by which to value other beings.** Individual human life is not the most important thing in the world. An individual human life has no more intrinsic value than that of a grizzly bear (in fact, some of us would argue that an individual grizzly life is more important than an individual human life because there are far fewer grizzlies). The human suffering resulting from famine and drought in Ethiopia is unfortunate, yes; but the destruction of other creatures and habitat there is even more regrettable. This leads directly to the next point.

- **The enthusiastic adoption of the philosophy of Deep Ecology or Biocentrism.** This simply and essentially means that all beings have an intrinsic value or inherent worth. Beings have value and live for themselves. Other beings (both animals and plants) and even so-called “inanimate” objects such as rivers and mountains do not exist for the convenience of human beings. The whole concept of “resources” is denied by this philosophy. We are in open opposition to the dominant philosophy of

¹⁴ “Around the Campfire” was an opinion column that appeared in the Earth First! It has subsequently continued to appear in other media such as *Wild Earth* or [<http://www.rewilding.org>][<http://www.rewilding.org>]. *N. from t.*

¹⁵ Despite the name, Round River does not refer to a specific place but to an Ojibwa myth about a river of life that sustains all relationships. Under that same name, a posthumous selection of Aldo Leopold’s diaries was published, it is possible that the name of these meetings was inspired by that book. *N. from t.*

our time (which includes Judaism, Christianity, Islam, capitalism, Marxism, scientism, secular humanism, etc.) and that is expressed in Gifford Pinchot's comment[687] that there are only two things in the world — human beings and natural resources. Ours, on the other hand, is an ecological point of view that sees the Earth as a community, and recognizes heretical truths such as "disease" (malaria) and "pests" (mosquitoes) are not evil manifestations to defeat and destroy but which are vital and necessary components of a complex and exuberant biosphere.

- **Understanding that Wild Nature¹⁶ is the real world.** The preservation of wild nature is the fundamental issue. "Wild nature" does not merely refer to the parks you hike in or the landscape. It is the natural world, the field for evolution, the cauldron from which humans emerged, the home of the others with whom we share this planet. Wild nature is the real world; it is our cities, our computers, our airplanes... our civilization of global commerce that are artificial and transient. The preservation of the wild and of natural diversity is the most important issue. Problems that only affect humans pale into insignificance. Of course, ecology teaches us that all things are connected, and as far as this is concerned, all other issues become subsets of the preservation of wilderness—for example, the prevention of nuclear war.

- **The recognition that there are too many human beings on Earth.** There are too many of us everywhere—in the United States, in Nigeria, in the cities, in the rural areas; with hoes and with tractors. Although there is obviously a bad and unscrupulous distribution of wealth and the resources necessary to meet the basic needs of humans, there are already too many of us (and our numbers continue to grow astronomically). Even if the inequitable distribution could be resolved, 5 billion, 7 billion, 11 billion human beings converting the natural world into material goods and human food would devastate the natural diversity built up in three and a half billion years.

I consider the population issue to be an absolute litmus test for Earth First!. It is so fundamental to the preservation of wilderness¹⁷, to the practice of biocentrism, that a refusal to acknowledge the need to reduce human populations for the future clearly defines one as a humanist and places one out of bounds on Earth First!. I am so convinced of this point as an indicator of whether someone is anthropocentric or biocentric, whether their allegiance is to the Earth or to humanity, that I would rather see the Earth First! movement torn to pieces to see him wasting his time discussing this. This does not mean that we cannot criticize the accumulation of wealth in fewer and fewer hands, the misallocation of resources, and the corruption of multinational corporations and Third World military juntas alike, but we must realize that grizzly bears, tigers, elephants and rainforests are not compatible with a skyrocketing human population.

¹⁶ "Wilderness" in the original. *N. from t.*

¹⁷ "Wilderness" in the original. *N. from t.*

- **The explicit questioning of, and even antipathy towards, “progress” and “technology”.** Looking at human history, we can see that in our “ascension” to civilization we have lost more than what we have won. We can see that life in a hunter-gatherer society was generally healthier, happier, and more secure than our current lives as farmers, industrial workers, or executives. For every material “achievement” of progress, there are a dozen lost things of deep value and ineffable meaning. We can proudly accept the pejorative adjectives “Luddite” and “Neanderthal.” (This does not mean that we should avoid all facets of technological civilization. We are *part of it*, yes, we use it; this does not mean that we cannot criticize it.)

- **The refusal to accept rationality as the only way of thinking.** In spiritual matters, there is room for great diversity within Earth First!, and nowhere is tolerance for diversity more necessary. But all of us can recognize that the linear, rational thinking of the logical left hemisphere of the brain¹⁸¹⁹ represents only a part of our brain, our thinking process and our consciousness. Rationality is an excellent and useful tool, but it is just that—a tool, a way of looking at things. Equally valid, perhaps ultimately more valid, is intuitive and instinctive knowledge. We can become more knowledgeable about fundamental truths by sitting quietly in a wild place than by reading books. Reading books, taking part in logical discourses, collecting facts and figures are necessary and important activities, but they are not the only ways to understand the world and our lives.

- **The absence of the desire to gain credibility or “legitimacy” before the gang of thugs that run human civilization.** Wanting to be accepted by the social environment in which you find yourself is a basic part of human nature. It hurts to be disqualified by the arbiters of opinion as “nuts”, “terrorists”, “crazy” or “extremists”. However, we are not crazy, it just so happens that we are healthy humans in an insane human society in a healthy natural world. We don’t have “credibility” for Senator James A. McClure or Secretary of the Interior Donald Hodel or MAXXAM20 President Charles Hurwitz—but they don’t have credibility for us either! (We have your attention, though.) They are crazy destroying everything pure and beautiful. Why should we have any desire to “reason” with them? We do not share the same vision of the world or the same values.

The US system is very effective at winning back²⁰ and moderating dissidents by paying attention to them and then encouraging them to be “reasonable” so that their ideas are taken more seriously. Appearing on the evening news, on the front page of the newspaper, in a national magazine—all of these are methods used by the powerful to entice you to share their worldview and sit down at the negotiating table to seek

¹⁸ Referring to the theory of bilateralization of the brain, in its popular and pseudoscientific version, according to which linear reasoning and grammar, for example, only operate on the left side of the brain. *N. from t.*

¹⁹ MAXXAM Inc., a US lumber company, which filed for bankruptcy a few years ago. *N. from t.*

²⁰ In the original “co-opting”, which, in this case, means the tactic that manages to neutralize or win over a minority by assimilating it into the established culture. *N. from t.*

some compromise. . The actions of Earth First! — both the bold and the comical — have garnered attention. If they are to get results, we must resist the siren songs of credibility, legitimacy and participation in decision-making in this society. We are failing the system, not reforming it.

- **The effort to go beyond the hackneyed and exhausted dogmas of the left, the right and the center.** These doctrines, whether they blame capitalism, communism or the devil for all the world's problems , they only represent mutually destructive quarrels between different factions of humanism. Yes, multinationals commit great evil (The Soviet Union is also a multinational); there is a great injustice in the world; the rich are getting richer and the poor poorer—but not all problems can be simplistically attributed to evil capitalists in the United States, Europe, and Japan. The members of Earth First! they are not left or right, we are not even facing each other. EarthFirst! should not be in the political struggle between humanist sects. We are involved in a totally different game.

- **The unwillingness to place any political, ethnic or class group on a pedestal and make it immune to question.** It is easy, of course, to recognize that white men in North America and northern Europe they have a disproportionate share of responsibility for the mess we are in; that middle- and upper-class First World consumers take an inordinate share of the world's "resources" and thus cause more destruction per capita than other people. But it does not follow from this that everyone else is innocent.

The Earth First! movement, for example, has a strong affinity with indigenous groups around the world. They clearly have a more direct and respectful relationship with the natural world. EarthFirst! it should support such groups in the common struggle where we can. Most Earth First! members, for example, support the Big Mountain Dine (Navajo)²¹ against relocation, but this doesn't mean we should pretend sheep aren't causing serious overgrazing on the Navajo reservation. We could support the subsistence lifestyles of Alaska Natives, but should we be silent about the clearing of old-growth forests in Southeast Alaska by Native American corporations, the efforts of the Eskimo Doyon Corporation²² of projecting oil exploration and development in

²¹ Plateau located in Arizona (USA) also known as "Black Mesa". In it, there is an Indian reservation shared by the Navajos and the Hopis. It is an area rich in coal and, therefore, they wanted to transfer to the Navajos. Jerry Mander dedicates chapter XV ("The imperative to destroy traditional Indian governments. The case of the Hopis and the Navajos") of his book *In the absence of the sacred*, to describe the precedents of oil extraction in that area. In addition, it provides information on the entire context of the relocation of the Navajos up to the year 1991. After that date, a coal mine was opened that moved the mineral through water pipes to a kind of thermal power plant that generated energy for the States of California. and Nevada. The water was drawn from the aquifer that was also used by the Navajo and Hopi. The region has a semi-desert climate. *N. from t.*

²² Doyon Limited, a company whose shareholders are of Eskimo descent and which owns a large tract of land in Interior Alaska with gold mines and believed to have large oil reserves. *N. from t.*

the Arctic National Wildlife Refuge²³, or commercial native trapping to supply the New York fur market? I find it racist to condemn or forgive someone based on their ethnic background.

Similarly, we have no problem punishing Charles Hurwitz for destroying the last wild redwood forest²⁴, yet sometimes sympathizing with the enslaved loggers. Of course, Hitler deserves the highest condemnation, but the guy who was pushing the Jews into the showers was also doing wrong. Generally speaking, industrial workers share the blame for the destruction of the natural world. They may be slaves to great tycoons, but, on the whole, they are happy, merry slaves who share their masters' worldview: that the Earth is a buffet²⁵ of resources ready for the taking. In fact, sometimes it is the rude man, the tenacious peasant from the rural proletariat, who holds the most violent and destructive attitudes towards the natural world (and towards those who defend it). They are victims of an unfair economic system, yes, but that should not absolve them of what they do. (This doesn't stop some loggers from opposing the destruction of old-growth forests, some may even be from Earth First!, but it's simply not valid to excuse someone for where they are on the economic ladder.)

- **A willingness to let our actions establish the finer points of our philosophy and the recognition that we really must act.** It is possible to debate indefinitely the finer points of a dogma, to perceive that one has to understand every nuance before you can act. In fact, many political movements become nothing more than discussion groups where participants sit around mentally jerking off and never get to work on the fundamental issues at hand. Others argue that you have no right to be concerned about the environment or to do whatever it takes to preserve it until you lead a pure and harmless lifestyle. We will never understand everything, we will never be able to plan any campaign down to the last detail, none of us will ever transcend a polluting lifestyle—but we can act. We can act with courage, with determination, with all the deliberations we can reach, with a love of things wild and free. We can't be perfect, but we can *perform*. EarthFirst! it is not a living room tribe, passive and secondary. We are warriors. We are a group of warriors. We have a job to do.

- **The recognition that we must change our personal lifestyles for ones more harmonious with natural diversity.** Yes, we must avoid the age of excess. We must try to practice what we preach. But, to one degree or another, we are all captives

²³ The Arctic National Wildlife Refuge is the largest wilderness area in the United States. It is located northeast of Alaska and borders Canada. Since its inception, there has been controversy over its possible oil and gas exploration and exploitation. controversy that continues to this day. *N. from t.*

²⁴ Referring to the Headwaters forest in California. Acquired in 1985 by Hurwitz's company, MAXXAM Inc., logging picked up its pace in this redwood forest and others nearby, becoming a focus of conflict between this company and US environmentalists in the 1990s. many of Earth First!. Since 1999, this forest has been a state reserve, although it may be subject to selective felling. *N. from t.*

²⁵ In the original smorgasbord, from the Swedish Smörgåsarbord, a buffet made up of different dishes from Swedish cuisine. *N. from t.*

of our economic system and cannot completely free ourselves. Arne Naess²⁶ points out that we cannot achieve a true deep ecology lifestyle, but it is the responsibility of each of us to start moving in that direction. There are contradictions—flying on a jet plane to help hang a banner at the World Bank in Washington, DC, to draw global attention to the plight of tropical rainforests; using a computer to produce copies for a newspaper printed on tree pulp²⁷ that pushes people to act; drive a truck along a forest track to access an area from which they are going to take wood, to protect it. We need to be aware of these contradictions, and do our best to limit our impact.

- **The commitment to maintain a sense of humor and joy in life.** Most radical activists are sullen, sanctimonious and humorless people. The members of Earth First! They are different. We do not rebel against the system because we are losers or unhappy. We are fighting for beauty, for life, for joy. We enjoy with delight a day in the wilderness²⁸, we smile at a flower, at a hummingbird. We laugh. We laugh at our opponents—and we laugh at ourselves.

- **The awareness that we are animals.** Human beings are primates, they are mammals, they are vertebrates, they are animals. The members of Earth First! they recognize their animality; we are not devotees of some New Age Teilhardian[701] eco-dreamer who says we must transcend our petty animal nature and take charge of our evolution to become higher moral beings. Instead, we believe we should get back in touch with our animality, to take pride in our sweat, our hormones, our tears, and our blood. We are fighting against the modern coercion that tries to turn us into dull and passionless androids. We do not live sanitized and logical lives; we smell, taste, see, hear and feel the Earth; we live with enthusiasm. We *are* animals.

- **The acceptance of eco-sabotage as a legitimate tool in the preservation of natural diversity.** No, not all members of Earth First! do ecosabotage, perhaps not even the majority, but there should be a reluctance to condemn the idea and general practice of ecosabotage. Check out some Earth First! T-shirts. There is a good chance that somewhere in it there is an allusion to sabotage²⁹. The mystique and tradition of “night work” pervades our tribe, and with it the general acceptance that properly done eco-sabotage is a legitimate tool for wilderness defense by some individuals. I think this is also a litmus test. It separates us from other groups, and helps define what is specific about being an Earth First! member.

These are general guidelines. They are not the word of the goddess, they are not intended to be dogmatic. But all of them are fundamental to Earth First!, I believe, and

²⁶ Arne DE Naess (1912-2009), Norwegian philosopher known for coining the term “Deep Ecology” (*Deep Ecology*) and establishing the foundations of that philosophical theory. *N. from t.*

²⁷ Referring to the paper pulp from trees as a contradictory fact with his thought. After all, paper is also one of the main products of the wood industry. *N. from t.*

²⁸ “Wilderness” in the original. *N. from t.*

²⁹ Some Earth First! They are usually illustrated with an Earth First! symbol: two tools arranged in an X, one is a stone ax and the other is an adjustable wrench (*monkey wrench*), similar to a plumber’s faucet, been linked for a long time to carrying out sabotage. *N. from t.*

have been fundamental to our tribe since its genesis in that Mexican lava field³⁰. They are the ones that distinguish us from other groups, the ones that define us as an entity. There are a variety of options in all of them and many require a tolerance of extremes. No, you don't have to be a misanthrope singing "Fuck the human race!" around the campfire at the Round River Gathering, but you tolerate that honest sentiment. You don't have to sabotage something, or even encourage it, but you don't condemn that another member of Earth First! wreck a bulldozer. You may disagree with an essay in the *Earth First! Journal* that criticizes the notion of the "noble savage" or another that praises the disease³¹, but you accept their themes as legitimate areas of research and discussion. I think it's about tolerance towards the above points, not necessarily 100% agreement with them, that marks the boundaries of Earth First!.

Being outside the mainstream of humanism, we are exposed to many attacks—both expected and unfair. We are very nervous. We are groping. But, in my opinion, the above points set the parameters of what the members of Earth First! are. They leave room for considerable diversity, but draw a limit.

From the beginning, I have believed in Earth First! as a grassroots and decentralized tribe. I'm glad to see her develop as she has. As I said before, I have no desire to dictate what Earth First! is, but I think these points represent the mainstream of Earth First!. If you vehemently disagree with them, I encourage you to get involved in another radical green group or start your own. There is considerable room for a diversity of groups defending the Earth. EarthFirst! You can cooperate with other groups, even when we disagree, as long as there is mutual respect and tolerance.

On the other hand (and I'm totally serious), if with these opinions I'm out of the mainstream of Earth First!, then please let me know and I'll be gone. I have no desire to embarrass good Earth activists if the above points are not considered crucial or detrimental to what they are trying to do. Yes Earth First! is no longer what I imagine it to be, so I will accept it and wish the new Earth First movement! hope everything goes well. But I don't feel like continually debating the above points within my tribe and will find a campfire somewhere else.

I apologize if my previous comments seem picky and moody. I honestly like almost everyone I've come across in the Earth First! movement. But in my seventeen years as a full-time wilderness activist³², I have seen what the pressures of moderation, of recuperation³³, of "softening" can do to a cluster. If we soften our style, our approach,

³⁰ In reference to the Sierra del Pinacate and the Altar Desert, a region where volcanism has modeled the landscape in the northwest of the State of Sonora, Northern Mexico. This place is very close to the border with the United States, specifically the State of Arizona, and it was on a trip to this place that the idea of creating Earth First! was conceived. *N. from t.*

³¹ In reference to the controversial article "Population and AIDS" (*Earth First! Journal*, vol. 7, no. 5, 1987), which analyzed the advantages of a disease such as AIDS to reduce the human population to levels not harmful to the Earth. *N. from t.*

³² "Wilderness" in the original. *N. from t.*

³³ "Co-option" in the original. *N. from t.*

our message, our tactics, so as not to offend anyone, so as to attract more and more people to Earth First!, we will lose what makes us Earth First!. If we extract the spiciness, the spicy green chilies, from Earth First!, we will be a bland porridge with little content.

Let's listen to our critics, let's grow with that criticism, but let's not get rid of our biocentrism, nor lose the "Earth" nor the "First" nor the sign "!" of our name.³⁴

³⁴ Dave Foreman (1947-) continued to write some articles in the following years (1988-90) dealing with some issues that seriously affected Earth First! and that they were transforming it. For example, in "The Question of Growth in Earth First!" (*Earth First! Journal*, vol. 8, no. 6, 1988) reflected on the growth in membership of the Earth First! (according to him, it had gone from around 2,000 in 1982 to around 12,000 members in 1988); in "Some Thoughts on True Believers, Intolerance, Diversity, and... Ed Abbey" (*Earth First! Journal*, vol. 9, n°5, 1989) takes up some of the points discussed in this article (need for diversity and tolerance within the movement, problems of excessive diversity, etc.); in "The Perils of Illegality" (*Earth First! Journal*, vol. 10, n°1, 1989) he discussed some practical aspects of engaging in sabotage, strategically choosing targets, and criticized existence within Earth First! of contrary anarchist positions, by doctrine, to the respect of the law; and in "Whither Monkeywrenching?" (*Earth First! Journal*, vol. 10, no. 1, 1989) recounted his arrest by the FBI and provided a few pieces of advice when carrying out sabotage, advice in which he implicitly criticized some acts that According to him, they did not respond to strategic needs but to other more personal motivations of some saboteurs. In 1990, he would publish, together with Nancy Morton, a farewell letter from Earth First! (*Earth First! Journal*, vol. 10, n°8, 1990) in which he announced his departure from the movement and returned to influence some point, for him, key. In that letter they wrote: "In summary, we see that the Earth First! The same thing is happening to it that happened to the Greens in West Germany—an attempt to transform an ecological group into a leftist one. We also see a transformation towards an openly countercultural/anti-establishment style and the abandonment of biocentrism in favor of humanism. Pay attention, we are not opposed to campaigns for social and economic justice. Generally, we support such causes. But Earth First! it has been from the beginning a wilderness preservation group, not a class warfare group. We still believe that the Earth comes first. We are uncompromising supporters of the process of evolution and of the non-human world. We remain true to the guidelines Dave offered in 1987 in 'Where Is Earth First Headed!'. Also, we are conservationists. We are not anarchists or leftists. We are biocentrists, not humanists." After his departure from Earth First! Foreman has been working at The Wildlands Project and, since 2003, at the Rewilding Institute. He was involved in launching another newspaper, *Wild Earth*, in the early 1990s and has written several books: *Confessions of an Eco-Warrior* (1991), a mix of autobiography and collection of articles, *The Lobo Outback Funeral Home*, a novel, *Rewilding North America: A Vision for Conservation in the 21st Century*, *The Big Outside: A Descriptive Inventory of the Big Wilderness Areas of the United States* with Howie Wolke, *Defending the Earth: A dialogue between Dave Foreman and Murray Bookchin*, *Man Swarm and the Killing of Wildlife* and, so far (2012), his latest book *Take Back Conservation. N. from t.*

Presentation of “THE WILD LANDS OF HISTORY”

The following text, like others that appear in *Untamed Nature*¹, refutes in a quite clear, sensible and elegant way certain postmodern and humanist arguments that are often used against the concept of Wild Nature to try to ridicule their defense and thus theoretically justify their destruction and taming.

In any case, the author, as usual among conservationists, suffers from a certain idealism. Thus, he considers that “the main reason why we abuse the land ... is „because we consider it a commodity that belongs to us’ instead of „a community to which we belong’” and insinuates that at least a good part of the The solution to the problem of its destruction and subjugation involves adopting as a society an ethic of moderation and self-limitation in relations with Nature. However, the former is rather a consequence and justification *a posteriori* of the abuse, not its main cause; and the latter is neither that simple to achieve nor, if possible, would be on its own very effective in conserving and restoring wilderness in the long term.

Another defect of this article is the conciliatory character that the author shows towards those who try to put or simply equate social justice with the defense of wild Nature. In reality, both ends are often not independent, but rather incompatible in the short or long term.

THE WILDLANDS OF HISTORY

By Donald Worster²

I live in northern Kansas, a part of the United States that is devoid of wilderness³—no vast stretches of land hundreds of miles long that are not used to produce raw materials. This area was once a prairie wilderness that stretched as far north as Saskatchewan; now, we have less than 1 percent of the original tall grass prairie left, and most of the short grass prairie is gone as well.

¹ See, for example, “Against the Social Construction of Wild Nature” by Eileen Crist

² Translation by Último Reducto of the version reprinted in *Wild Earth. Wild Ideas for a World Out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the article “The Wilderness of History”, originally published in *Wild Earth* magazine 7, No. 3 (Fall 1997). © 1997 Donald Worster. *N of t*.

³ “Wilderness” in the original. The term “wilderness” refers to ecosystems or areas with little or no humanization. In the present text “wilderness”, unless explicitly indicated otherwise, has been translated as “wilderness”. *N. from t*.

Two years ago, it's true, Kansas finally got a protected prairie area. Fighting the Department of Agriculture⁴, the ranchers association, and former Senator Robert Dole (who was reluctant to spend \$10 million on a new acquisition for the National Park System but didn't mind spending \$1,000 millions of dollars on a plane so the National Guard could repel our enemies) was long and hard. Even now, with the Tall Grass Prairie National Preserve⁵ made a legislative reality, a Texas businessman keeps his cattle there, on a lease, and anti-park forces insist that the cattle stay where you are; they demand that it be a monument to the meat industry rather than be returned to bison and pronghorn. In any case, they say, that land was never wild.⁶

These kinds of claims are gaining support, albeit unintentionally, from some of my colleagues in environmental history, many of whom I fear have not spent enough time among those good people who say "work for a living." - members of the Department of Agriculture, for example - and do not sufficiently appreciate how hard it is to try to establish an ethic of environmental limitation and responsibility in the midst of fierce advocates of private property and the market. Otherwise, my colleagues would be a little more careful about the sensational headlines they promote, such as "Wild Nature is a Bankrupt Idea"⁷.

That is not the headline that William Cronon⁸ really wanted to see when he wrote the controversial essay "The Trouble with Wilderness, or Getting Back to the Wrong Nature"⁹ published in the book *Uncommon Ground: Howard Reinventing Nature* (1995). What he meant, I think, is that wilderness defenders have sometimes damaged their own cause with immature rhetoric that repels thoughtful people and lacks any kind of social compassion. You are right in this regard. The wilderness movement needs more self-scrutiny, it needs a greater commitment to social justice - and, above all, it needs the patience to read its critics more carefully. On the other hand, Cronon and some of the other authors of *Uncommon Ground* should take a dose of their own medicine. They have at times inflamed the discourse, bypassed the deepest ethical core of the movement, and created a few weak arguments of their own - arguments that require critical examination and unmasking. Therefore, in the hope of a debate that is more mutually respectful and fruitful than the one we have had so far, I review some of those arguments. Here is my list of the main mistakes made by some environmental historians about wild nature¹⁰.

Mistake #1: North America, we're told, was never a "wilderness"—not even parts of it.

⁴ "Farm Bureau" in the original. *N. from t.*

⁵ "Tallgrass Prairie National Preserve" in the original. *N. from t.*

⁶ "That land was never wilderness" in the original. *N. from t.*

⁷ "Wilderness Is a Bankrupt Idea" in the original. *N. from t.*

⁸ Cronon is one of the foremost postmodern critics of the idea of Wild Nature. *N. from t.*

⁹ "The problem with the wilderness, or going back to the wrong nature". *N. from t.*

¹⁰ "Wilderness" in the original. *N. from t.*

Some revisionist historians now claim that ignorant Europeans, buoyed by their "virgin land" fantasies and racial prejudice, got it all wrong. The continent was not a wild land; it was a landscape completely domesticated and managed by the native peoples. It was the Indians, not low precipitation rates or high evaporation rates, that created a vast expanse of grassland stretching from the Mississippi River to the Rocky Mountains, and they did so through continual burning. Herds of bison were herded as if they were domestic animals in a large meadow. They cultivated wild plants and made a garden of the place. All across the continent, they fully civilized this wasteland long before the white man came to it.

I respect Native American stewardship and would not detract from any of their considerable achievements, but these claims by historians are gross extrapolations from limited examples. Merely two million people scattered across what is now Canada and the United States, armed with primitive stone tools, could not really have "tamed" the entire continent.¹¹ Not even today's 300 million Americans and Canadians, armed with far more powerful technology, have yet fully tamed the continent; in the United States, following strict evaluation criteria, some 100 million acres¹² of virtually pristine wilderness are under protection and even more unprotected, and in Canada areas without roads, towns, mines or factories they still dominate most of the north of the country.

Some historians further tell us that the Indians were driven from their domesticated homeland to *create* a wilderness for the white man. There certainly was mass dispossession, often bloody and ruthless. Yet if our national parks, wilderness areas¹³ and wildlife refuges were once the territories of Native Americans who shifted from tribal identity over time, so were the lands on which where our cities, farms, universities and even the very plots on which the houses we inhabit are built are located. What should we do about it now? Should we return all parks and wilderness areas¹⁴ to Native Americans? Should we open them up to subsistence hunting (by people probably armed with modern rifles and snowmobiles) or agriculture? If we do, we are logically obligated to allow Native Americans to take back our campuses, suburbs, and cornfields as well. However, I have not heard anyone seriously propose that the universities of Los Angeles or Stanford be returned to their "rightful owners." Why not? Why are parks and protected wilderness areas seen as presumed forms of expropriation while the vast portion of the country dedicated to modern economic uses is not really questioned? Obviously, Indian land claims are not what really matters in this case; what matters is discrediting preservationists.

¹¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

¹² 1 acre = 0.4 hectares. *N. from t.*

¹³ "Wilderness areas" in the original. *N. from t.*

¹⁴ *Idem. N. from t.*

A more sensible policy would be to find out if any of the 100 million acres of protected wilderness¹⁵ are currently violating valid treaty rights, and if they do, resolve it in court or return the land to its owners. corresponding owners, as would be done with any disputed land. However, I have not seen any historian actually undertake such a research project into land claims within the [1644] protected wilderness area system. Nor do I see any clear and defined proposals about where and how to alter the size, shape, or rules that govern our protected wilderness areas¹⁶. Meanwhile, note that any American citizen, Indian or not, has free and equal access to the nation's¹⁷[1647] wilderness areas, but the same cannot be said for access to universities. or to residential areas.

Mistake n[o]2: Wilderness[XV111] is not something real but just a social construct dreamed up by wealthy white romantics.

Some of this oversimplified thinking goes back to Roderick Nash's book *Wilderness and the American Mind*, which (despite its many virtues) established a flawed narrative that environmental historians have plagiarized ever since. The now-widespread theory begins by speaking of an ancient and intense Judeo-Christian hostility to the wild, an anti-wildness¹⁸ culture of spectacular proportions and longevity. Such hostility supposedly reached a climax in Puritan New England, when every farmer frowned into the woods as he left home. The theory then shifts to a dramatic reversal of attitudes as wealthy, white, educated, secular, urban Americans became nature-loving romantics. Part of the thinly veiled moral of this tale is that ordinary people, without an education or income, have suffered severe cultural backwardness and cannot be counted on to bring about any significant environmental change. But a more complex reading of the past would suggest that the love of wilderness¹⁹ was not simply something "discovered" or "invented" by a few wealthy men with Harvard or Yale degrees at the end of a long dark age. .

If one assumes that typical theory, then it becomes very easy to turn the whole thing into a polemic against elitist snobs who seek refuge in the wilderness at the expense of peasants, workers, Indians, or the world's poor. Of course there were and are people like that. If the theory did not contain a kernel of truth at bottom, the revisionists would not get any kind of audience at all. It is, however, a tiny bit, not the whole complicated truth about what wild nature²⁰ has meant to people throughout the ages or what drives them to protect it today.

Contrary to established theory, the love of nature (that is, of the wilderness) was not merely a "cultural construct" of Europe's romantic period. It has much older roots; it may even have roots in the very fabric of human feeling and consciousness, stretching

¹⁵ *Idem. N. from t.*

¹⁶ *Idem. N. from t.*

¹⁷ *Idem. N. from t.*

¹⁸ "Antiwilderness culture" in the original. *N. from t.*

¹⁹ "Wilderness" in the original. *N. of the t.*

²⁰ *Idem. N. from t.*

back far into the evolutionary past, transcending any cultural patterns. More recent historians have been too quick to dismiss any deep remnant of humanity as "essentialist" and have been quick to reduce all thought and feeling to a mere product of the shifting tide of "culture." Nineteenth-century romanticism, with its glorification of the sublime, was indeed an important cultural expression, but it can also be understood as an attempt to recover and express those deeper sentiments which in all kinds of culture have linked the beauty of the natural world with a feeling of completeness and spirituality. There's no denying that the enthusiasm for America's wilderness was a cultural fad, but it was also inspired by that thirst for the natural world that goes beyond the cultural and persists across time and space. Ultimately, it fostered in the United States a spirit of frontier-born freedom that itself reflected cultural as well as biological needs. More importantly, that enthusiasm was shared equally by rich and poor.

Historians have tended to overlook the broad appeal that the wilderness movement has had for society, particularly during the 20th century. They like to tie him to the image of hot-headed, big-game gamer, and wealthy New Yorker Teddy Roosevelt, especially if they want to lampoon him a bit, and ignore all the men and women of humbler origins who, before and after him, they played an important role in saving the wild lands. John Muir and Ed Abbey certainly attracted quite a bit of attention, although historians have rarely appreciated the fact that their origins were rural and their roots were not elitist. Nor have they placed much emphasis on the millions of²¹ wildlife enthusiasts who don't like to kill big animals, or get their chests out, and who don't order from the Eddie Bauer²² catalogue. And so, having left out of the "construction" of wild nature²³ the people of the poorer class, the historians turn and proclaim: "Behold, wild nature²⁴ has always been a fetish of the upper classes. And finally, with no little condescension and inconsistency, they decide that it is necessary to correct the "naive" and popular misinterpretation that the masses make of these matters.

Mistake #3: Wilderness preservation has been a distraction from addressing larger environmental issues.

What are these problems, specifically? The protection of less exalted beauty close to home, not just on the remote public lands of the West, we are told. The health and well-being of urban people, especially impoverished minorities, in the neighborhoods in which they live. The intelligent and effective use of the natural resources that provide our livelihoods. I recognize that, for an environmentalist, all these things are important problems to face. They are related to each other in many ways and should not be dissociated and rigidly compartmentalized. In fact, I don't know of any wilderness advocate

²¹ *Idem. N. from t.*

²² American company dedicated to the sale of clothing, footwear and sports equipment for camping, mountaineering, hunting and fishing. *N. from t.*

²³ "Wilderness" in the original. *N. of the t.*

²⁴ *Idem. N. from t.*

who is so stubborn as to deny the existence, importance, or interconnectedness of these other environmental issues. There may be one, but I haven't met them. However, I have met people, and I will defend them here, who, based on deep moral conviction, believe that preserving the world's last wilderness is a higher moral obligation than cleaning up the Hudson River or preventing soil erosion. Someone who devotes his life to wilderness problems instead of those other problems is not necessarily misguided or immoral or in need of "re-education."

However, the main historical issue in this case is whether the wilderness movement has in fact significantly diminished Americans' interest in other environmental issues. It is often affirmed that yes, over and over again; Outside carefully protected wilderness areas, it is claimed, the countryside is a mess and its defenders' "obsession" with wilderness encourages many environmentalists to do nothing about it. Preserving wilderness is sometimes said to give Americans a green light to unscrupulously exploit other, less pristine environments. But where is the evidence that this has been so on a major scale? The main reason why we abuse the land, as Aldo Leopold told us long ago, is "because we consider it a commodity that belongs to us" instead of "a community to which we belong". Wilderness protection by itself may not change that situation, but neither is it responsible for it.

Since the Wilderness Act²⁵ was passed in 1964, the United States has seen an extraordinary increase in the number of people who call themselves environmentalists, and the issues they pursue range from preserving remaining and threatened wetlands from the construction of shopping malls to stopping discharges on Indian reservations, through ensuring that emissions from industrial chimneys are controlled. The movement has become increasingly diverse, inclusive and broad. Far from being a distraction, the example of wilderness activism may even have stimulated such a diversification of environmental consciousness to take place across the country!

I live in a place where the most immediate, pressing and practical need is to create agriculture that is less destructive to soil, water and biota, along with preventing real estate speculators from turning our towns into cultural and biological deserts. I am on the board of the Land Institute, which is trying to meet this important environmental need. However, I can still cherish the idea of a great unmanipulated wilderness for this continent in which the processes of evolution can continue to play out more or less as they have for millennia. Does my commitment to trying to save the Alaskan wilderness "separate" me from where I live? Some historians say yes, but people are more complex than that. Like millions of other Americans, there is a wide range of things that concern me, near and far. I can support the Library of Congress without losing interest in my local library.

We have a legacy of land misuse across the country. It has left us degraded forests, grasslands and cities, and that legacy requires deep reform along a broad front. De-

²⁵ The Wilderness Act is a law that regulates the declaration and protection of wilderness areas in the United States. *N. from t.*

veloping an ethic of care and moderation wherever we live and wherever we draw our resources - in that 95 percent of the nation's surface that is not protected as wilderness²⁶ - is a clear and important need. How are we going to do it and move towards intelligent, fair and sensible use of the land beyond the protected wilderness areas²⁷? Our recent history does not suggest that we need to get rid of the wilderness "fetish" to achieve this, nor that we need to get rid of the main and most popular arguments made for preserving wilderness, which on the whole have worked quite well in the face of relentless opposition. .

Wilderness²⁸ has been a symbol of freedom for many people, and they meant freedom in both a primordial and a cultural sense. Freedom, it must be recognized, can become another way of calling irresponsibility. However, almost always the preservation of the freedom of the wild lands in the United States has been closely linked to a moral principle of restraint that acts as a counterweight. In fact, this link between freedom and moderation may be the most important feature of the wilderness movement. Those 100 million acres exist not only as a place where evolution can continue on its own and where we humans can find refuge from our technological creations, but also as a place where we can learn the virtue of self-limitation: this far we drive, plow, mine and cut, but no further.

Ancient religions promoted moral restraint among their followers through the practice of paying tithes, a practice that has almost completely disappeared under the impact of the market revolution. However, the practice of tithing is too good an idea to let go. Without even realizing it, we have created in the form of protected wilderness areas²⁹ a new, more secular way of tithing old religions. We have set aside a small portion of the field as the part that we give back to the land that sustains us, the land that was here before any of us. We haven't paid a full tithe yet, but we're still working on it.

A place of self-restraint but also a place of freedom for all living things, protected wilderness areas³⁰ have promoted, I believe, a broader ethic of environmental responsibility throughout this nation. Far from being an indefensible obsession, the preservation of the wilderness has been one of our noblest achievements as a people. Without getting too big about American exceptionalism, I will say that this is a model of virtuous performance for other societies to study and emulate. This is not to say that historians have been wrong to criticize the weaknesses of the wilderness movement. They have erred only when they have denigrated the movement as a whole, recklessly encouraged its enemies, and created bad historical arguments. We have to remember that the real danger we face as a nation is not loving the wilds too much but loving our purses more.

²⁶ "Wilderness" in the original. *N. of the t.*

²⁷ *Idem. N. of the t.*

²⁸ *Idem. N. of the t.*

²⁹ *Idem. N. of the t.*

³⁰ *Idem. N. of the t.*

Note

1. I am using the cautious but rigorous estimate by Douglas H. Ubelaker of the Smithsonian Institution, which appeared in his 1988 article “North American Indian Population Size, AD 1500 to 1985”, *American Journal of Physical Anthropology* 77:291. He calculates an average density of eleven people per 100 square kilometers, with the lowest being two or three in the arctic and subarctic regions and the highest seventy-five in California. HF Dobyns’ estimates in *Their Number Become Thinned* (Knoxville: University of Tennessee Press, 1983) are much higher and controversial.

Presentation of “IS NATURE SOMETHING REAL?”

The text that we present below is one more response¹ to the often dishonest post-modern critics against the concept of Wild Nature.

Much of what the author says is very accurate and timely, and this is what makes us consider this text worthy of publication. However, as usual, it is necessary to point out at least two of its weak points.

The main one is that the author (like quite a few other conservationists) is a Buddhist hippie whose countercultural ideas and attraction to “non-Western” (read “Eastern”) philosophies unfortunately pervade his otherwise fairly insightful text. . The truth is, not all of us are as clear as he is that Buddhism or Hinduism are useful philosophical references when it comes to defending the notion of the wild or simply the existence of objective reality; nor that deep down they do not often cause more confusion and mental imbalances than those they intend to solve (especially among “Westerners” who adopt them to try to feel “different”).

Given the above, it is not surprising that the author makes a call to “understand the pain and discomfort of working people everywhere”, which has little to do with the theme of the text. Leftism often accompanies hippieism. However, the social question (that is, the problems related to social justice, to justice and equality in the relations between human groups and individuals) is, in general, something that is at least completely unrelated to the problem of destruction and subjugation. of wild nature by civilization. That, when it does not aggravate it with humanist and progressive proposals and goals. The fundamental values and goals of those who care about the social issue are often incompatible with those of those who care about wild Nature, although many of the latter, like the author, are not even aware of this.

IS NATURE SOMETHING REAL?

*By Gary Snyder*²

¹ See also, for example, Dave Foreman’s “The True Wilderness Idea”

² Translation by Último Reducto of the reprint of “Is Nature Real?” published in *Wild Earth. Wild Ideas for a World Out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002). The article was originally published in *Wild Earth* 6, n°4 (Winter 1996/1997): 8-9, under the title “Nature As Seen from Kitkitdizze Is No „Social Construction”. © 1996 Gary Snyder. *N of the t.*

I'm starting to get pissed off at the vicious arguments put forth by well-paid intellectuals who try to bring nature and the people who value it down, yet pretend to be smart and progressive.

The idea of nature as a "social construct" - a shared cultural projection that is viewed and shaped in the light of social values and priorities - if exposed fully to the bright light of philosophy, would seem like a better subset of the worldview. developed from Mahayana Buddhism or Advaita Vedanta, which claim (as only part of their strategy) that the universe is *maya*, or illusion. By stating this, Asian philosophers are not saying that the universe is ontologically devoid of any kind of reality. What they are saying is that, in general, our way of seeing the world is a biological (based on the particular qualities of the body-mind of our species), psychological (reflects subjective projections) and cultural construction. And, consequently, they suggest a way of examining one's own seeing, so that it sees whom it sees and thus that seeing is truer.

The current use of the expression "social construction", however, cannot go deeper, since it is based on the logic of European science and the "Enlightenment". This school of thought, in its search for some new kind of metanarrative, has been unable to examine its own narrative - which is the same Western view of nature as a source of resources that has been offered to humanity to use. As a spiritually (politically) empty sphere, this socially constructed nature would have no other reality than the quantification offered by economists and resource managers. This is in fact the ultimate commodification of nature, carried out by supposedly advanced theorists who prove to be simply the pinnacle of the "wise use" movement³. Deconstruction, done with a compassionate heart and with the intent to gain wisdom, turns Mahayana Buddhism into a logical and philosophical exercise that plumbs to the bottom of what is being deconstructed and surfaces with compassion for all beings. Deconstruction without compassion is self-aggrandizement.

So I understand the idea that wild nature⁴ is a social construction; why shouldn't it be? What is more to the point, and which I cannot find in the writings of the anti-nature crowd, is the awareness that the wilderness is the place where the large and rich ecosystems are found, and therefore (among other things) a home for beings that cannot survive in any other type of habitat. Recreational use, spirituality, aesthetics - good for people - also make wilderness valuable, but are secondary to the importance

³ „Wise use' movement" in the original. The "Wise Use movement" emerged in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

⁴ "Wilderness" in the original. The term "wilderness" refers to ecosystems with little or no humanization. Depending on the context it can be translated in different ways. In this text, unless otherwise specified, it has been translated as "wild lands." *N. from t.*

of biodiversity. The protection of natural diversity is essential for the planetary health of all.

Some of these critical scholars construct, and then attack, the notion of “unspoiled wilderness”⁵ and again this is nothing but pounding in cold iron. It is well known that humans and protohumans have lived virtually everywhere for hundreds of millennia. “Virgin” is just a relative term and, as much as the landscape may have been used by humans, until ninety years ago the planet still had vast stretches of wilderness that are now sadly shrinking. Much of the wilderness was also the territory of indigenous cultures that fit well into what was inhabited wilderness.

Attacks on nature and wild ecosystems⁶ from ivory towers come at just the right time to bolster global exploiters, resurgent logging companies (here in California Pacific Lumber after the Charles Hurwitz lawsuits) and those who would repeal the Endangered Species Law⁷. It seems as if there was an infamous alliance between capitalist materialists and Marxist idealists to attack a rural world that, they say, Marx considered idiotic and boring.

Heraclitus, the Stoics, the Buddhists, the scientists and the ordinary old and awake people all knew that everything in this world is ephemeral and unpredictable. Even the early ecologists working with the Clements succession⁸ knew this! Now, however, a generation of resource biologists, suckled on the skim milk of Daniel Botkin’s theorizing⁹, are promoting what they think is a new paradigm that relegates the concept of climax to the dumping ground of ideas. . Certainly none of the early scientific ecologists ever doubted that disturbances come and go. It seems as if this specific case of harassment also appeared in time to support the logging companies and exploiters of the land. (Despite wind blows, vermin, fires, droughts, and landslides, many plant communities remained in essence for many millions of years before the age of man.)

⁵ “Pristine wilderness” in the original. *N. from t.*

⁶ “Wilderness” in the original. *N of the t.*

⁷ “Endangered Species Act” in the original. US law passed in 1973 and created to protect critically endangered species from extinction as a result of unrestrained economic growth and development. *N. from t.*

⁸ The theory of plant succession, created by Frederic Clements in 1916, comes to say that the process by which plant communities establish themselves in a place, change and are replaced over time follows a series of steps relatively predictable and determined, called ecological succession, plant succession or vegetation series. Said steps are directed to the establishment of a mature plant community or climax. *N of the t.*

⁹ American biologist who questions the ideas of ecological balance and climax and, with them, that of ecological succession, and considers that the normal state of ecosystems is disturbance. Certain environmental authors, such as George Sessions, link it to the “wise use” movement (see “The wild, the cyborgs and our ecological future” in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/lo-salvaje-los-ciborgs-y-nuestro-futuro-ecologico>][<http://www.naturalezaindomita.com/textos/lo-salvaje-los-ciborgs-y-nuestro-futuro-ecologico>]) and, in fact, the theories of The current contrary to the idea of ecological equilibrium and climax, of which Botkin is one of the greatest exponents, are often used to justify human intervention in ecosystems and human management of the biosphere. *N. from t.*

It is a real shame that many scholars in the humanities and social sciences find it so difficult to accept the rise of "nature" as an intellectually serious field. Despite all the talk about "others" in theories around the world today, when faced with an authentic Other, the non-human world, the response of these anti-nature intellectual newcomers is to close ranks. and declare that nature is actually part of culture. Which may just be a ploy to maintain funding for their specialties.

Much of this rhetoric, if translated into human politics, would be like saying "African Americans are a social construct of whites." And then they could also claim that South Downtown Los Angeles is problem territory because it has been exaggerated by some white liberals, territory whose apparent moral problems are also illusory, and that what really needs to be done about African Americans it is to try to better understand how white writers and readers constructed them. However, when dealing with issues that concern their fellow humans, liberal critical theorists do not speak this way because they know what kind of response they will receive. In the case of nature, since they are still under the illusion that it is not really *there*, they allow themselves this moral and political superficiality.

Conservationists and ecologists have asked for it, in a way. We have not yet managed to communicate the importance of diversity. Many, if not most, citizens are really confused as to why such importance seems to be attached to owls or fish that until now had not even been heard of. Scientists have to be heard, but the writers and philosophers among us (myself included) should speak more clearly about our deep feelings about the value of the non-human. We need to keep cool, write clear prose, reject obscurity, and not intentionally exaggerate. And we need to understand the pain and discomfort of working people everywhere.

A *Wild Area*¹⁰ is always a specific place, as it is there for the local creatures that live there. In some cases, a few humans will live in it as well. Such places are rare and must be rigorously defended. *The Wild*¹¹ is the process that surrounds us all, nature self-organizing: creating the vegetal zones, humans and their societies, all of them extremely resilient, beyond what we can imagine. Human societies create a multitude of dreams, notions and images about the nature of nature¹². However, it is not impossible to get a fairly accurate picture of nature with a little first-hand experience - not very difficult, I would take these dubious professors for a walk outside, show them a bit of the spectacle of nature. disappearance of ecosystems and perhaps it would lead them to clean up a stream.

¹⁰ "Wilderness" in the original. *N. of the t.*

¹¹ "Wild" in the original. *N. from t.*

¹² "About the nature of nature" in the original. It is not a mistake by repetition. The author refers to the nature or essence of Nature. *N. from t.*

Presentation of “VALUE CHARACTER

NATURAL IN THE ANTHROPOCENE”

In the first two decades of the 21st century, the idea has been gaining ground that the world has been transformed to such a degree by human beings that it can be considered that we live in a new geological epoch: the Anthropocene (the Age of Man). So far, this new term does not seem too problematic since it is apparently limited to denominating a situation (the profound influence of the human being in the current biosphere) without evaluating it. However, things are not as simple as it seems. In the first place, because many of those who have dedicated themselves to popularizing the term-concept of the Anthropocene (the self-styled "neoconservationists", "neoverdes" or "ecopragmatists") do not limit themselves to describing and naming the current situation of degradation of the biosphere, but, at the very least, they assume that the destruction and human domination of the Earth's ecosystems caused by the techno-industrial civilization is inevitable; that when they do not value it positively and defend it enthusiastically. So, to a large extent, they have monopolized the use of that term. And secondly, because the very concept of the Anthropocene is not merely descriptive and morally neutral, since at least it implies an overestimation of the real human influence on the biosphere; that is, of the real power of human societies to modify and influence the Earth's ecosystems. And not only that, if uncritically accepted as valid, the concept of the Anthropocene suggests the non-existence of the wild today, since, given its exaggerated nature, it falsely implies that there is no longer any place that is not not only influenced, but completely dominated by the human being. However, it is one thing to have affected in one way or another and to a greater or lesser extent the majority of the ecosystems and places in the Biosphere, which is bad enough, and another that they are under our control and that they no longer follow their own operating guidelines, but rather our management guidelines; that is to say, that they are no longer savages. Certainly, thanks to technological development and overpopulation, we have the power to destroy and greatly degrade many of Earth's ecosystems but, given their complexity, we do not have and will never have the power to fully control and direct their functioning.

Unfortunately, some of those who claim to value wild Nature and reject techno-industrial society have naively fallen into the trap of adopting and using the term-concept of the "Anthropocene" as if it were simply an innocuous way of naming the current state of the biosphere. . And so, by publicly adopting and uncritically using

the term, they not only suggest an ideological affinity with neoconservationism that they don't really have, but they also give it scope. For this reason, we have considered it opportune to publish the following article (among others[a]).

VALUING THE NATURAL CHARACTER IN THE ANTHROPOCENE: NOW MORE THAN EVER.

By Ned Hettinger

There has been some hype recently about the idea that we are entering "the age of man." Popularized by a leading proponent of applying geoengineering to the planet

[a] See also "Beyond climate change" by Eileen Crist ([<http://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-sistema-tecnoindustrial/ms-all-de-la-crisis-del-clima>][<http://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-sistema-tecnoindustrial/ms-all-de-la-crisis-del-climate>]) or "The Earth is not a garden" by Brandon Keim ([<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-tierra-no-es-un-jardn>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-tierra-no-es-un-jardn>]), in Indomitable Nature.

b Translation of the chapter "Valuing the Naturalness in the „Anthropocene", from the book *Keeping the Wild*, edited by George Wuerthner, Eileen Crist and Tom Butler (Island Press, 2014). Translation by Último Reducto. N. as a response to climate change¹, "the Anthropocene" has proponents among environmental scientists, historians and philosophers, as well as in the press. Although it is a useful way of dramatizing the human impact on the planet, the concept is deeply insidious. And most importantly, it threatens the key environmental values of "naturalness"[c] (by which I mean the degree to which nature is uninfluenced by humans) and respect for nature. This essay is a critical appraisal of the Anthropocene notion, showing not only that it seriously exaggerates human influence on nature but also that it fosters inappropriate environmental politics and metaphysical and moral conclusions about humanity's role on the planet. Despite our dramatic impact on Earth, a substantial degree of "natural character" still remains; and growing human influence makes valuing the natural in environmental thinking and policy more important, not less.

Some geologists have been debating whether the human impact on Earth is significant enough to warrant designating a new epoch with a name relative to us: *the Anthropocene*. It is unquestionable that humans are a dominant species that affects nature on a global scale. Humans currently consume 30 to 40 percent of net primary production[d], use more than half of surface freshwater, and fix more nitrogen than

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

all other terrestrial sources combined.² Human beings rival major geological forces in our propensity to move soil and rock from one place to another.³ Overfishing has had massive effects on marine life; our dams control the flow of water in most major rivers; and non-native species are homogenizing Earth's ecosystems with the help of humans. Our contribution to greenhouse gases is expected to increase the planet's temperature by between 2°C and 5°C, affecting the climate and thus organisms on a global scale.⁴ Human-caused extinctions are said to exceed 100 to 1,000 times the background extinction rate.⁵ One study concluded that less than 20 percent of the land surface has escaped direct human influence.⁶ It seems very likely that we are altering the planet on a scale comparable to the major events that marked changes in geological ages in the past.

However, the idea that we now live in "the age of man" has gone well beyond the concrete geological claim that the fossil record thousands of years from now will show a distinctive trace of human influence. Some proponents of the Anthropocene concept interpret the facts about human influence as justifications for general metaphysical and ethical claims about how we should conceive of the human relationship with nature. Our impact, they argue, is now so pervasive that traditional environmental ideals of preserving and respecting nature are outdated. Today, the natural character has either disappeared or is so tenuous that the desires to preserve, restore and value it are impossible dreams. The human virtues of humility and restraint towards the natural world are no longer possible or desirable and we need to come to terms with and adapt to a humanized world. Whether we like it or not, we have been forced to play the role of planetary managers and we have to manipulate nature according to our values and ideals. Instead of lamenting or resisting this new order, we should celebrate "the age of man", because it offers us hope for a world in which humans take their responsibilities seriously and free themselves from restrictions based on misguided desire. to preserve a virgin nature that has long since disappeared.

[c] "Naturalness" in the original. It would literally translate as "naturalness", but because today in Spanish "naturalness" is practically never used to refer to anything other than human behavior (and certainly never to refer to the degree to which ecosystems are not are affected by human beings, which is what the author refers to), in this

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

text it has been translated as “natural character”, in almost all occasions. Cases where this term has been translated otherwise are explicitly indicated by footnotes. *N. from t.*

[d] Net primary production is the amount of total energy fixed by photosynthesis minus the energy consumed by respiration in autotrophic organisms. Broadly speaking, it can be considered that it is the amount of biomass produced by plants. *N. from t.*

A recent op-ed in the *New York Times* titled “Hope in the Age of Man” illustrates this troubling moral and metaphysical perspective.⁷ Written by environmental professionals, it argues that “given the enormous alteration of the earth carried out by humanity” our time “well deserves to be considered the age of man.” The authors criticize those who worry that the designation “Anthropocene” will give people the false impression that no place on Earth is natural anymore. They suggest that the importance given by conservation biologists to the protection of remaining relatively wild ecosystems is due to the fantasy of “an untouched natural paradise” and the pernicious and misanthropic “ideal of pristine wild ecosystems”. They end the article with the absurd Promethean statement that “this is the land we have created” and, therefore, we should “manage it with love and intelligence”, “designing ecosystems” to establish “new glories”.

Philosophers have also been seduced by the concept of the Anthropocene and have been led down similar paths. I will focus here on certain writings by Allen Thompson, an environmental philosopher at Oregon State University. Thompson claims to have found a way to “love global warming”.⁸ He argues that the anxiety we currently feel in response to our new and “overwhelming responsibility toward the prosperity of life on Earth... bodes well for humanity”⁹ and should inspire us with “radical hope” in that

⁷ For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN.

we can find a new kind of “environmental goodness...distinct from the autonomy of nature”¹⁰.

Like other proponents of the age of man, Thompson exaggerates the degree to which humans have influenced nature. At some point he says that “we now know that the fundamental conditions of the biosphere are something for which, collectively, we are responsible.”¹¹ However, it is certain that we are not responsible for the existence of sunlight, gravity, or water; neither of the photosynthetic capacity of plants, of the biological process of predation, nor of the chemical bonds between molecules; nor, more generally, the diversity of life on the planet nor its spectacular geology! The fact that we have influenced some of these conditions of life, and in some cases significantly, is something very different from our being “responsible” for them. Proposing that human beings have an obligation, for example, not to destroy the beauty or biodiversity of a mountain by removing its top is not the same as saying that we are responsible for the beauty of the mountain or its biodiversity. On the contrary, nature is responsible for these values, not human beings. Even in cases where we should restore these conditions by making them more suitable for the biosphere (perhaps by cleaning a river of pollutants), we cannot claim to be responsible for the river’s ability to support life, even if we are responsible for having degraded it and have responsibility to clean it up.

A sympathetic reading of Thompson’s spiel about “responsibility for the fundamental conditions of the biosphere” is that he is simply positing a negative duty to prevent further undermining of the naturally occurring basic conditions for life on the planet that do not exist. is posing the responsibility for the creation of them. However, Thompson, I believe, has more than just that in mind. His language suggests a metaphysical affirmation of the power and importance of human beings on the planet. He writes: “There was a time when the planet was bigger than us, but it is no longer”.¹² However, the reason given for this new importance of human beings - that “there is no corner of the globe, nor feature of our biosphere, that escapes the influence of human activity”¹³ - is completely insufficient to justify such a metaphor. It is undoubtedly true that human

Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (The Earth Runs Out , page 237).

¹⁰ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹¹ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

beings have (and have long had) a greater causal impact on the planet than any other species taken separately. Human influence may be so massive that future geologists will see our impact in the geological record. However, this is a very different thing from saying that the human causal influence on Earth is greater than the non-human causal contributions due

[e] “Pristine wilderness” in the original. *N. from t.* to the combination of geological, chemical, physical and biological forces. Human beings are a fundamental force in shaping the planet, but we are only one among many.

Like other proponents of the Anthropocene, Thompson finds in the “age of man” an increase in the authority of humans in regards to our relationship with the planet. He states that “whether we accept it or not, we humans now shoulder the responsibility of planetary stewardship.”¹⁴ Note that what Thompson rejects here is not only Leopold’s view of our place as “mere members and citizens” in the natural world, but also various other conceptions of the relationship of human beings to nature: we are not caretakers, or restorers of the Earth, nor those in charge of cleaning up the mess we have caused, nor repentant ones who try to restore what we have destroyed, nor healers of a wounded Earth. Instead we are managers - we are in control - of this place. We humans are the bosses. Instead of developing our human capacities for “gratitude, wonder, respect, and restraint”¹⁵ when it comes to nature, we should be taking control and running the place. Instead of honoring the Earth, human beings, “as adoptive parents”, need to “enable” the “prosperity” of life.¹⁶ However, as many have pointed out, the Earth does not need us and the non-human world as a whole would be much better off without us. Our responsibility to nature is not primarily to enable nature, but to stop disabling it. Our responsibility towards the planet is not to control and manage it, but - at least in many respects - to reduce our control and impact.

For Thompson and other of his proponents, the Anthropocene means that traditional environmentalism, which places the value of natural character at its core, is dead. “My analysis supports the idea that environmentalism in the future ... will give

¹⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁵ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “...it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁶ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

significantly less place to valuing the good of nature's autonomy."¹⁷ I think the opposite is guaranteed. It is true that there is a diminishing amount of nature[f] on the planet and, therefore, there is less of it left that we can value. However, it is also true that what remains has become even more valuable. If one starts from the assumption that nature's autonomy from humanity is valuable, and one takes into account that humans control more and more aspects of the natural world -thus reducing its natural character and making its autonomy increasingly more and more rare-, then the nature[g] that remains increases in value. Rarity is a property that increases the value of those things previously considered good. Furthermore, if natural character is a value, then the more it is compromised by human control and domination, the more (not less) important it is to take steps to restore it, as well as protect what remains of it.

The natural character that persists in nature altered or impacted by human beings is a very important object of assessment. Unless one ignores a central point held by proponents of the natural - that naturalness comes in degrees - and accepts the discredited notion that for something to be natural it must be utterly virgin, certain aspects of nature can be natural (ie relatively autonomous from humans) and can be valued as such even when they have been significantly influenced by humans. Take urban parks as an example: although they have been significantly shaped by humans, they retain a lot of natural character, and such parks are valued by those who enjoy them due (in large part) to that natural character. For example, they would be much less valued if the trees were made of plastic and the birds were genetically modified.

A central strategy of the proponents of the Anthropocene is to accuse their opponents of assuming the outdated idea of a pristine nature. According to this way of seeing things, nature must be virgin and immaculate to really be nature. As a result, either we have reached the end of nature (a la McKibben)¹⁸ or we are mired in profound ignorance about human influence in general. For the most part, this tactic attacks a straw man:

[f] "Naturalness" in the original. *N. from t.* [g] *Idem.* *N. Advocates of an environmentalism that prioritizes respect for the autonomy of the natural world are well aware of the disappearance of pristine nature, however this does not undermine their commitment to respect for, and -when possible- the empowerment or restoration of the autonomy of nature.*

¹⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers[*]< em>*, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁸ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

Ironically, proponents of the Anthropocene themselves often draw on the idea of nature as untouched and use it to resort to the false dichotomy: either nature is untouched or it is created (or tamed) by human beings. Let us consider a few comments expressed by proponents of the Anthropocene today: “An interesting way of looking at nature now, in the Anthropocene, is that nature is something we create...There is really nothing around us that is not there. been touched by us. And if there is something that has not been touched by us, that is mostly the result of a decision ... Nature is something that you have to nurture yourself, *just* your garden”;¹⁹ and “There really is no such thing as a nature unsullied by people. On the contrary, ours is a world of domesticated nature, albeit to varying degrees, from national parks to megalopolises with their skyscrapers.”²⁰

So while the Anthropocene proponents criticize McKibben’s ideal of a pristine wilderness (which led McKibben to the ludicrous conclusion that “we now live in a self-made world”²¹), they come to the same conclusion! and, to a great extent, for the same reasons! However, as we have explained, there is still a substantial amount of nature[h] left and it is possible and desirable to value that nature[1778]²² reduced. There is still a lot of nature that defenders of traditional environmentalism based on “natural character” can value and defend.

Furthermore, proponents of the Anthropocene ignore that human-impacted natural systems have the potential to undo humanization and that there is a real possibility that a greater degree of naturalness will return to them.²³ That restoration, rewilding[j] and simply letting nature[k] recover on its own are desirable environmental policies (although certainly not the only environmental goals) is something that the promoters of the Anthropocene seem to reject. Note that it is not necessary for nature to return to its original reference state or trajectory in order for the natural character to be increased; the reduction of human control and influence on the course of nature is

¹⁹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²⁰ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²¹ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

²² *Idem*. N. from t.

²³ “Red pine” in the original. American Red Pine, *Pinus resinosa*. N. from trans.

enough. Even if, as proponents of the Anthropocene insist, it is true that “there is no going back”, this does not mean that the only way forward is a fully managed future increasingly devoid of nature[l]. While letting nature run its own course along a path that we do not determine is in itself clearly a “management decision”, this does not show that that path is controlled or impacted by humans.

By way of conclusion, I see the recent focus on the age of man as the latest incarnation of human hubris. He betrays himself as guilty of not appreciating the profound role non-human nature continues to play on Earth and of arrogantly overvaluing human role and authority. Not only does it ignore an absolutely crucial value in properly respecting nature, but it leads us astray in environmental policy. It will make us underestimate the importance of preserving, restoring and rewilding nature and it will also make us promote the invention of ecosystems and geoengineering. Furthermore, by promoting the idea that we live on a planet that has already been domesticated, there is a risk that, as a consequence, monetary and public support for conservation will appear futile and cease.²⁴ We should not become comfortable with the

Anthropocene, as some have suggested, but rather combat it. This comfort does not represent the virtue of reconciliation, but the vice of capitulation.

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Presentation of "WILD NATURE: WHAT AND WHY?"

The following text, like many of those included in this section, tries to refute, quite successfully, the typical attacks on the concept of Wild Nature. From its reading, the intelligent reader will be able to extract important ideas and conclusions about what the wildness of ecosystems really consists of. And this information may help you not to fall into errors and naivety when referring to wild Nature, as well as not to be fooled by the fallacies of those who try to make us believe that the wild neither exists nor is it a value that should be defend.

Likewise, a very interesting idea mentioned in the text is what the author calls "landscape amnesia" (what others call "shifting ecological baseline syndrome"). As true wilderness areas disappear, people tend to gradually accept and take as normal or desirable (ecological references) environments that are really nothing more than, at best, degraded states of what was once there was and what actually should be. This has a lot to do, for example, with the way in which many ecologists and similar people tend to pose the ecological ideal in Europe (a continent for the most part intensely humanized for many centuries): a "green" rural or urban world, with a "nature" mostly domesticated and largely dependent on human beings and their culture. When the only thing that is known and that surrounds one, apart from the streets and buildings of towns and cities, are farmland, secondary forests, meadows, forestry plantations and cattle pastures, it is easy to fall into assuming that this is the true nature. It takes a conscious effort and quite a bit of ecological knowledge to realize that authentic (ie wild) Nature is something else: what was there before all that domestication and degradation.

On the other hand, as is customary among conservationists, the author focuses on defending the goal of legal preservation of wild Nature. However, although this strategy may be necessary and relatively effective in the short term, it will not serve in the long term to protect wild ecosystems from the siege to which they will inevitably be subjected, sooner or later, by the techno-industrial society. And, precisely, the conservation problems or deficiencies that the author himself recognizes and mentions in this text are proof of the above, examples of why and how legal conservation will not manage to protect the wild in the long term. The solution to the conflict between wild nature and techno-industrial society must be another, different from the legal preservation of protected areas and the deceitful search for a balance between two parties that are actually irreconcilable.

WILD NATURE: WHAT AND WHY?

By *Howie Wolke*[a]

A few years ago, I led a group through the wilderness of northern Alaska's Brooks Range during the early fall caribou migration. I believe that if I had twenty lives I would never again experience something so primal, so simple and rudimentary and so completely and unequivocally wild. If beauty is in the eye of the beholder, it filled my eye more

[a] Translation of the chapter "Wilderness: What and Why?", from the book *Keeping the Wild*, edited by George Wuerthner, Eileen Crist and Tom Butler (Island Press, 2014). Translation by Último Reducto. *N. t. from t.*

[b] "The wilds" in the original. *N. t.* than anything else. Perhaps that expedition - into one of the last remaining terrestrial wildernesses on Earth - is my personal measuring stick, my personal quintessence of what constitutes wilderness among all my wilderness experiences throughout my life. . The tundra was a rainbow with autumn fur. Fresh snow covered the peaks and periodically the valleys as well. Animals were everywhere, thousands of them, moving through valleys, across mountain passes, over divides, over ridges. The wolves chased the caribou. A grizzly bear feeding on a carcass temporarily blocked our route through a narrow pass. It was a week I will never forget, a week in an ancient world that elsewhere is fast being engulfed by the terrifying technophilia caused by the 21st century nature deficit.

Some claim that wilderness[d] is defined by our perception, which in turn is determined by our circumstances and experiences. For example, a person who has never been to the Brooks Range and instead has spent most of his life confined to large cities with little exposure to wilderness might consider a forest on a farm or a park to be "wilderness." small state park criss-crossed by tracks; or even a cornfield, though this seems to stretch the relativity theory of wild[e] nature to the point of patent absurdity. According to this line of thought, the wild[f], like beauty, is in the eye of the beholder.

However, those who believe that perception defines the wild[g] are completely wrong. In our culture, wilderness[h] is a very distinct and definable entity and can be viewed at two complementary levels. First, from a legal point of view, the Wilderness Act[1242] of 1964 defines wilderness quite clearly. A declared wilderness is an "undeveloped" and "primal" area, a wild piece of public land with no civilized overtones that is managed so that it remains wild. Section 2c of the Wilderness Act defines a wilderness area as "unencumbered" in the sense of "unlimited" or "unrestricted." It further defines wilderness as "undeveloped federal land area that retains its original character and influence, without permanent human settlement or improvement." The law also generally prohibits road construction and resource extraction such as logging or mining. It also sets a general guideline of 5,000 acres[j] as the minimum size for a wilderness area. What's more, it restricts all mechanical devices, from mountain bikes and hunting carts[k] to loud, smoking, all-terrain vehicles and snowmobiles, to non-wilderness areas.

Primarily drafted by the late Howard Zahniser, the Wilderness Act creates a National Wilderness Preservation System (SNPTS) on federally managed public lands. Wilderness is managed by four federal land management agencies: the US Forest Service[l], the National Park Service[m], the US Fish and Wildlife Service[n] and the Department of Land Management[o]. To declare a wilderness protected, the United States Congress must enact a statute and the president must sign it. Also, according to the Wilderness Act, the SNPTS must be uniformly managed as a single system.

In addition to seeing wilderness[p] as a legal entity, we also have a closely related cultural view steeped in mystery and romance and influenced by our history, which certainly includes the hostile view of wilderness[q] that was especially prevalent during the early days of colonization. Today, our cultural view of the wild[r] is generally positive. The cultural view of wilderness[1244]¹ today is heavily influenced by the Wilderness Act, which means that when people simply talk about wilderness, without referring to legal definitions, It speaks of a wilderness that is large, wild, and untapped, where nature rules. And that certainly does not refer to a forestry plantation or a cornfield.

In short, then, the wilderness is nature with all its magic and lack of predictability. Not only do they lack roads, motors, pavement and buildings, but they come loaded with unknown wonders and challenges that at least some human beings increasingly crave in today's increasingly controlled and confined world. Unfettered wilderness, by definition, includes fire and insects, predators and prey, as well as the dynamic unpredictability of wilderness, existing in its own way and in its own right, with utter disregard for preference, convenience and human comfort. And also by human perception. As the etymological roots of the word "wilderness" indicate, it is about "land with its own will"[t] and the "home of wild beasts"[u]. They are also the ancestral home of everything we know in this world and even spawned civilization, although I'm not convinced that the latter was a good thing.

Neither the Wilderness Act nor our more general cultural perception of wilderness[v] requires wild landscapes[w] to be pristine. The authors of the Wilderness Act wisely recognized that, even in 1964, there were no landscapes left that completely escaped the imprint of humanity. Consider acid rain, global air pollution, and the man-made climate crisis. That is why they defined wilderness areas as those that "appear *overall* to have been *mainly* affected by the forces of nature being in them *significantly* *immeasurable* trace of the works of man" [my italics]. In fact, those who cite the pervasive impacts of humanity to wrongly proclaim that wild nature[x] no longer exists are unable to understand the difference between wild and unspoiled. Absolutely unspoiled wilderness may be history, but there's still plenty of wildness left on this troubled planet[y]. As the burgeoning human population continues its evil growth within the shrinking domain of wilderness habitats, the value of wilderness—and of protecting wilderness—is increasing.

¹ Ditto. N. from t.

So the wilderness is not just any undeveloped, undeveloped landscape. They are not merely a blank space on the map. Because inside that blank space could be all kinds of harmful human activities that have long been destroying the essence of wilderness: gas and oil pipelines, power lines, water lines, wastelands blighted by overgrazing, and scars caused by off-road vehicles. , for instance. No, the wilderness is not just a place that lacks development. They are primitive places that have not been spoiled, sacred places in their own right. They may not be entirely pristine, but they are still functional storehouses for evolutionary processes; by far the best left. The wilderness designation is a statement addressed to those who would otherwise keep the industrial behemoth advancing: Do not touch! This place is special!

Wilderness declaration is not simply a political strategy to prevent bulldozers from encroaching on wilderness. This is a valid use of our wilderness legislation, yes, but when we see wilderness solely - or even primarily - as a deterrent to industry and motors, we miss all the important things that actually make a difference. the wild areas of other less extraordinary places. Some of those things include tangible physical attributes like native fauna and flora, clean water, and minimal noise pollution. However, in many ways, the intangible values of wilderness areas are equally important in differentiating them from other landscapes. Amazement and challenge are two of them. For many of us, the simple knowledge that some landscapes are beyond our control provides a breath of sanity. Solitude and the feeling of connection with other forms of life are also maximized in the wilderness.

Wilderness[aa] also offers us some defense against the collective disease of *landscape amnesia*. I started using this expression in the early 1980s while writing in an educational journal about wilderness and roadless areas. It began to occur to me that as we tame nature, each new generation becomes less aware of what constitutes a healthy landscape as many of the components of that landscape gradually disappear. In the same way that someone who watches the proverbial frog inside the pot of water slowly approach the boiling point without ever noticing the point at which the frog goes from being alive to being dead, society does not realize that the surrounding landscape disappears until it is too late.

For example, few individuals today remember that the extensive and healthy cottonwood forests of Virginia were commonplace in floodplains throughout the West. So today's generations see our empty floodplains as "normal." Therefore, there is no pressure to restore that ecosystem. This principle applies to wilderness areas. These zones keep at least some untouched, wild, natural areas for people to see. We do not forget what we can still see with our own eyes. When we keep those areas wild, there is less risk of us succumbing to wilderness amnesia[bb] and forgetting what the real wilderness is like.

What sets wilderness areas apart is their dynamic character; they are always flowing, one year or decade or century is never the same as the next, they never stop, and they are completely unconstrained—despite the relentless attempts of humans to control

almost everything. Natural processes such as wildfires, floods, predation, and native insects can (or should) shape wilderness landscapes just as they have in the past.

It has been said that wild nature[cc] cannot be created; that it can only be protected where it still exists; and there is some truth in it. However, there is also a large gray area. Although most of the new protected wilderness units are made up of relatively untouched, roadless areas, the United States Congress is free to declare any area of federal land, including lands that have been impacted, as wilderness. human activities in the past, such as logging and road construction or the use of off-road vehicles. In fact, Congress has declared such lands as wilderness numerous times. Once declared, government agencies are legally bound by the Wilderness Act to manage such land as wilderness. Normally time and the elements do the rest. For example, most of the wilderness in the eastern United States

[aa] “Wilderness” in the original. *N. from t.*

[bb] “Wilderness amnesia” in the original. *N. from t.*

[cc] “Wilderness” in the original. *N. from t.*

The United States once suffered severe logging and were criss-crossed with roads and tracks. They have now recovered much of their former wild character.

Perhaps the section of the Wilderness Act that has been most overlooked is the one that deals with the care of declared areas. The Wilderness Act directs managers to keep wilderness areas “untouched” and for “the preservation of their wilderness character”. This means that *the law prohibits the degradation of protected wilderness areas*. Therefore, one would assume that once an area is declared a wilderness, all would be well, at least in that little corner of the world. However, one would be wrong.

This is because, despite the poetic and pragmatic genius of the Wilderness Act, land managers routinely ignore the law and thus hardly any SNPTS units deliver on the promise of untouched wilderness. obstacles[dd]. To be fair, wilderness managers from government agencies are often under tremendous pressure - often at the local level - to ignore abuses. Sometimes their budgets are simply not enough to get the job done. On the other hand, we citizens pay our officials to enforce the law. When they fail to adequately maintain the character of the wilderness, they violate both the law and the public trust.

Throughout the SNPTS, degradation is rampant. Invasions of exotic plants, predator control by state wildlife managers (yes, in wilderness areas!), eroding multi-lane horseback riding tracks, trampled lake shores, swimming pools Bulldozer water storage facilities, the proliferation of construction and use of motorized equipment, overgrazing by livestock, and illegal entry by motor vehicles are just a few of the current problems. Many of these problems seem minor taken individually, but taken together they add up to the decay of the system, constituting a plethora of small but growing grievances that I call “creeping degradation,” even though some of these examples appear to be moving forward. at full speed, not little by little. External influences, such as climate change and chemical pollution, are adding to the problems of wilderness[ee] as we head into the challenging, and perhaps even daunting, decades ahead.

Apart from wilderness, both understood as a cultural idea and taken as legal entities, there is another dichotomy relating to them. It is the dichotomy of declared wilderness versus “lower case” wilderness. America’s public lands include perhaps a couple hundred million acres of undeveloped, largely roadless wilderness that—so far—lacks government protection. These “roadless areas” constitute “lowercase” or “*de facto*” wilderness. This is the stark reality of the early 21st century: Given the growing human population and its search for resources to exploit in nearly every remaining nook and cranny of the Earth, we are fast approaching the day when the only remaining significant natural habitats will be those that we choose to protect - either as wilderness or as other (lower) categories of protected lands. Within not long, most other sizable natural areas will be gone.

In order to get as many road-free areas added to the SNPTS as possible, some wilderness advocacy groups support special conditions on new wilderness projects to placate those who oppose such areas. Examples include conditions that enforce rights to graze cattle in wilderness areas, allow ATVs and helicopters to circulate, authorize[ff] incompatible uses such as dams and other water projects, declare exemptions from regulations to commercial operators, as well as many other cases. So we legalized overgrazing, the use of ATVs by ranchers and

[dd] “Untrammelled wildness” in the original. *N. from t.*

[ee] “The wilds” in the original. *N. from t.*

[ff] “Grandfather” in the original. It refers to the so-called “grandfather clauses” (literally “grandfather clauses”) according to which certain individuals or groups are exempt from complying with a new regulation for having certain “acquired rights” prior to the new regulations. *N.* wildlife managers, overzealous fire management, and destructive new water projects - just to mention a few of the incompatible activities that are sometimes allowed in declared protected wilderness areas. These and similar activities strip both the wilderness system and the idea of wilderness[hh] of their wilderness[gg] character. And when we allow the idea of wilderness[ii] to degrade, it is inevitable that society will gradually accept as “wilderness” spaces that are less wild than they were in the past. Once again it is the disease of amnesia of the landscape or amnesia of wild nature[jj].

An equally huge threat to wilderness is the recent trend to create new wilderness areas with borders that are drawn to exclude any potential or detectable conflict, also to appease opposition. So we have small, fragmented “wild” areas, sometimes with borders dominated by amoeba-shaped borders surrounding small nuclei of habitat. Or large otherwise continuous roadless areas are transformed into small fragmented “wild”[kk] units because Congress approves motor vehicle roads through them. These trends alarm conservation biologists who are concerned with biological diversity and the protection of entire ecosystems. If we can’t sue and work for true wilderness, we’ll never get it. That’s for sure.

To some, especially those who identify engines or resource extraction with freedom, the designation of protected wilderness areas seems restrictive. In reality, however,

the wilderness has more to do with freedom than any other landscape. I mean the freedom to roam and, yes, the freedom to be wrong, because where else could we be so immediately aware of the physical consequences of our decisions? Freedom, challenge and adventure go together and the wilderness offers ample doses of each - "Should I try to cross this way?" "Can I avoid that bear by taking a detour?" "Is there a big storm approaching or not?" When we enter the wild lands we leave behind all the securities. We are faced with the unknown. Things often don't go as planned. Wild nature[1246]² is rudimentary and fundamental in ways that we have largely lost to culture. This loss, by the way, weakens us. Wild nature[mm] strengthens us.

Freedom. In the wilderness we are free to hunt, fish, hike, creep, slide, swim, ride horseback, canoe or raft, cross-country ski, view wildlife, study nature, photograph, and contemplate anything that might arouse our interest. We are free to follow our spiritual values, whatever they may be, without any pressure from the official authorities of organized church or state. And we're generally free to do any of these things for as long as we want. The wilderness is also the best environment for the little-practiced but vitally important activity of doing absolutely nothing - I mean nothing at all, except perhaps watching the clouds float by over some wonderful wilderness[nn].

Wilderness[oo] offers an essential antidote to the growing civilized excesses of urbanization, pollution, technology and popular culture. Wildlands provide clean water and control flooding, and act as a storehouse for clean air. They provide many tons of healthy meat, as our healthiest fish and game populations are associated with the wild (who says "landscape doesn't feed"?). And wilderness reduces the need to create politically and socially contentious lists of threatened species. When we protect habitat, most species thrive.

By giving nature a respite from human manipulation, wilderness supports the evolutionary process. They help maintain connectivity between the population centers of large, wide-ranging animals - especially large carnivores. This protects genetic diversity and increases the resilience of faunal populations, which are so important for the ecosystem. We are beginning to understand that without large carnivores, most natural ecosystems spiral into biological loss and depletion.

Wilderness is also our primary reference environment. In other words, they are the metaphorical ruler by which we measure the health of all human-altered landscapes. How could we ever make smart decisions in forestry or agriculture, for example, if there was no benchmark to compare against? Of course, wilderness areas act as authentic landmarks only if we allow them to be wild and keep them unfettered.

Wild nature[pp] also has to do with humility. It is a reminder that we don't know everything and that we never will. In the wilderness[qq] we are part of something much bigger than our civilization and ourselves. It pushes us beyond the ego and that, I think, can only lead to good things. Perhaps above all else, wilderness is a recognition that non-human life forms and the landscapes that support them have *intrinsic value*,

² "Wilderness" in the original. *N. from t.*

simply because they exist, regardless of their multiple benefits to the environment. human species. Intrinsic value is a difficult concept for some to grasp, especially when it comes to life or non-human habitats. So, no, I cannot absolutely prove the validity of the idea of the intrinsic value of wilderness[rr] (any more than I can prove the intrinsic value of my grandmother); its validity depends on the basic values that one has and on the cultivation of receptivity and the ability to listen. Few of those who spend much time in nature[1248] will deny this.

The wilderness is emphatically not primarily about entertainment, although that is certainly one of its many assets. Nor with the “me first” attitude of those who metaphorically see nature as a cake that has to be divided among different groups of users. It has to do with selflessness, putting our egos aside and doing what is best for the earth. It has to do with the whole, not with fragments. After all, protected wilderness areas - despite their problems - are still the healthiest landscapes with the cleanest waters and tend to support the healthiest wildlife populations, especially for many species that have become rare. in or have been removed from places that are less wild.

Having earned a living as a nature guide/monitor[tt] for thirty-five years, I have had the great fortune to experience first-hand many wild places throughout western North America and sometimes far beyond. If I had to sum up what I’ve learned in one succinct sentence, it would probably be this: *Wild nature[uu] is all about moderation.* As Howard Zahniser put it, managers of wilderness must be “keepers, not gardeners.” When in doubt, leave them alone. Because if we fail to temper our manipulative impulses in the wilderness, where else on Earth will we ever find untrammelled land?

Ultimately, when we fail to protect, maintain and restore true wilderness, we lose the opportunity to pass on to our children and grandchildren - and to future generations of non-human life - the irreplaceable wonders of a world that is fast becoming a mere weak I remember a much better time. Fortunately, we still have the opportunity to both properly declare and protect a considerable amount of once-enormous wilderness[vv]. Let’s not miss this opportunity. We need to protect as much as possible and keep it wild.

[vv] *Idem. N. of the t.*

THE MYTH OF THE HUMANIZED PRE-COLUMBIAN LANDSCAPE

By Dave Foreman

University of Wisconsin geographer William M. Denevan is a leading critic of what he calls "The Virgin Nature Myth[b]." He states that "the 16th century Native American landscape was a humanized landscape almost everywhere. The populations were large."¹ Arturo-Gomez-Pompa and Andrea Kaus echo this statement: "Scientific findings indicate that virtually every part of the globe, from boreal forests to the humid tropics, has been inhabited, modified, or managed throughout our past. human."² J. Baird Callicott similarly asserts that "the idea of the wilderness[c] is regrettably ethnocentric. It overlooks the historical presence and effects that Aboriginal peoples had on virtually every ecosystem in the world."³

How much truth is there in these theoretical assertions? What do the research and facts really tell us? Some questions we should ask ourselves about the Myth of Virgin Nature are:

- How big was the native population?
- How widespread was the native population?
- How extensive were the impacts on the native population?
- Do ecosystems recover from human impact?
- And, finally, is the Myth of Virgin Nature necessary for the *Idea of Wilderness Protected Areas[d]*?

Having explored these questions, I will second University of Oregon geographers Cathy Whitlock and Margaret Knox who say: "It is not surprising that assigning a significant role to primitive peoples is a popular concept today among those who defend the active management of both wilderness areas and exploited land[e]."⁴ In fact,

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in

ranching apologist Dan Dagget calls for ranching in the drylands of the West and ultimately domesticating the wilderness because he believes that American Indians had already domesticated the land before North America was born. occupied by white settlers.⁵ Michael Soulé points out that right-wing anti-conservationists in the United States argue that "since the West is no longer wilderness, there should be no regulatory constraints on the pursuit of short-term profit maximization on public lands," and that social environmentalists leftists claim that the Amazon rainforest was created

[a] Translation of the chapter "The Myth of the Humanized Pre-Columbian Landscape", from the book *Keeping the Wild*, edited by George Wuerthner, Eileen Crist and Tom Butler (Island Press, 2014). Translation by Último Reducto. *N. from t.*

[b] "The Pristine Myth" in the original. *N. from t.*

[c] "Wilderness" in the original. The term "wilderness" refers to lands with little or no humanization. In this text it will be translated as "wild lands" or "wild areas", unless explicitly stated otherwise. *N. from t.*

[d] "Wildernes Areas" in the original. Here it will be translated as "wilderness protected areas" unless otherwise indicated. *N. from t.*

[e] "Commodity lands" in the original. *N. of the t.* by the Indians and, therefore, this justifies "later material remodeling".⁶ The political and ecological implications of the "humans-have-always-been-everywhere" perspective are chillingly clear.

How many native population were there?

Denevan has suggested a total population of 53.9 million for the New World in 1492: "3.8 million for North America, 17.2 million for Mexico, 5.6 million for Central America, 3 million for the Caribbean, 15.7 million for the Andes and 8.6 million for the lowlands of South America."⁷ Others have *supposed* that there were as many as 8 million people living north of the Rio Grande. However, Douglas H. Oberlaker of the Smithsonian Institution believes it was only 2 million.⁸ Denevan's edited anthology,

the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

⁷ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

The Native Population of the Americas in 1492, shows only how diverse the estimates are, how questionable the evidence behind them is, and how ideology influences them. Denevan openly acknowledges that his estimates are simply the result of multiplying Uberlaker's by two, which he considers too conservative.⁹ Although I believe that Uberlaker's population estimates are more accurate, I will use Denevan's here so that I am not so easily accused of underestimating the actual population.

How widespread was the native population?

Certainly nearly 23 million people in Mexico and Central America would make for a large and often dense population. However, for North America north of the Rio Grande, the Denevan estimate is merely 3.8 million. Keep in mind that the combined population of Canada and the United States today is over 330 million. Even taking Denevan's calculations for granted, the pre-Columbian population would be little more than 1 percent of the current one. Furthermore, these nearly 4 million people were also not spread evenly across the landscape. There were large regions that were rarely visited by human beings - still less had permanent settlements - due to the inhospitable environment, the small total human population at the time, its uneven distribution, its limited technology, the lack of horses and the continuous wars and attacks. Archeology supports my position. In addition, some areas, such as the Colorado Plateau in the present-day Southwestern United States, and the greater Yucatan area of Central America, had been depopulated centuries before Columbus' arrival due to drought and farmers overrunning the carrying capacity of the land, and afterwards its wildness character had largely recovered.

University of Wisconsin geographer Thomas Vale, after carefully considering various population estimates, wisely concludes that "much of the area of the West [of the present-day United States] was only lightly inhabited." In order to find more evidence to support his position, Vale uses archaeology, ethnology, ecology and paleoecology both to estimate the actual area used by the natives north of the Rio Grande for their settlements and for agriculture and to calculate how much land was affected by other

⁹ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out*, page 237).

activities, such as vegetation modification and logging. It shows that, to a great extent, there were immense areas that were not affected by the Indians.¹⁰

And as for the stronghold of the wilderness in the contiguous United States today—the Rocky Mountains—William Baker, professor of geography at the University of Wyoming, estimates that “the population in the Rockies themselves in AD 1500 it could have been approximately 32,000 inhabitants.”¹¹ This is a smaller population than the city of Missoula, Montana. That population, scattered throughout the Rockies, was far from crowding the region, at worst.

Seen on the large time scale of the 500 billion years of complex animal life on Earth, human presence has been for an extraordinarily short time and our impact until very recently was scattered and slight.[1602]] What happened during the immensity of the times prior to our appearance? Postmodern deconstructionists and their supposed political rivals, free-market theorists, seem to believe that nothing happened—or at least nothing that matters. I have come to suspect that such self-centered humanists are really incapable of imagining a time or place without the presence of human beings. They are hard-core social constructionists and can be adamant enemies of nature protection except where it directly benefits people and where what is being protected is one of those Disneyland-type parks with hordes of visitors everywhere.

How extensive were the impacts of the native peoples?

What was the level of impact that indigenous peoples had in America? The obvious answer is that no one knows for sure. Until recently, it was widely believed that the natives of northern Mexico had little effect on the landscape. This is what the Puritans of New England claimed in order to justify their appropriation of land they considered “unused” by the Indians.[1603] The pendulum has swung to the other extreme in recent years, claiming that even the tiniest populations transformed pre-Columbian ecosystems - especially through fire. The “Myth of the Virgin America” has been replaced by the “Myth of the Humanized Landscape”.[1604]

¹⁰ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹¹ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

The question to be discussed is not whether the natives touched the land, but to clarify to what extent and where. Even if certain populated and cultivated places were not self-regulating land[f] due to burning, agriculture and other native uses, it cannot be inferred from this that the same was true everywhere. Does the fact that Los Angeles is paved mean that the entire surface of the United States is paved? Are we to consider the Bob Marshall Wilderness Area in Montana a man-made landscape, just because most of Illinois is a man-made landscape? Of course not. Those early explorers and later settlers who, based on the wild lands they found, extrapolated that all of America was a wild land before the arrival of the Europeans are imitated today by the deconstructors who, starting from some specific sites modified by the natives extrapolate that all America was domesticated by the Indians. Both notions are unfounded - and stupid.

The first wave of expert hunters to arrive in the Americas some thirteen thousand years ago rapidly caused the extinction of dozens of species of large mammals unaccustomed to such a predator. The Pleistocene-Holocene extinction had profound effects that may still be reverberating across American ecosystems.[1605] In certain regions of pre-Columbian America, the high density of human population and intensive agriculture caused serious degradation of ecosystems and the extermination of wildlife. However, it is preposterous to say that between 2 and 4 million people had completely domesticated the territory north of the Rio Grande. According to University of Kansas historian Donald Worster, "Two million people scattered across what is now Canada and the United States, armed with primitive stone tools, could not really have 'tamed' the entire continent. Not even today's 300 million Americans and Canadians, armed with far more powerful technology, have fully tamed the continent yet."¹²

A key piece in the myth of the domesticated landscape is that the natives lit fires throughout North America. More than ten years ago, however, Reed Noss, one of the leading experts on North American ecosystems and a former editor of the journal *Conservation Biology*, pointed out that fires caused by lightning best explained the presence of vegetation adapted to fire than the fires set by the Indians.¹³ Ecologist Craig Allen of the US Geological Survey[g] confirms this for northern New Mexico:

Every 5 to 20 years there were widespread fires everywhere ponderosa pines were growing[h], with somewhat lesser frequencies, on the order of every 15 to 40 years ,

¹² By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹³ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it*" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

in forests composed of stone pine[1606]¹⁴ and juniper[j] at lower altitudes as well as in mixed coniferous forests at higher altitudes Given our dry spring weather and frequent thunderstorms, lightning is believed to have caused the vast majority of these fires. This idea is supported by the records of about 4,000 lightning-caused fires that were documented between 1909 and 1996 by the Jemez Mountains firefighting operation, and by the more than 16,000 lightning strikes recorded in the Jemez region by a lightning detection system between 1985 and 1994.¹⁵

Forest ecologist, paleoecologist and director of the Harvard Forest at Harvard University David Foster has also tested claims that New England Indians created the vegetation patterns of that region by burning. He says that “the paleoecological record offers no support for such views and, when supplemented by other historical data, instead presents a very different picture of the overall landscape. Sites studied in the central Massachusetts highlands have recorded fires and associated vegetation dynamics, but they are separated by intervals of centuries or millennia...In the Berkshires and northern Vermont highlands, even lower fire frequency.”¹⁶ Foster adds that “the charcoal record does not support the idea of extensive and frequent management of the land through the use of fire by Native Americans [in New England].”¹⁷

It is perhaps Thomas Vale who has most carefully scrutinized the claims about the humanized pre-Columbian landscape. “The desire to imagine humanized landscapes in pre-European times derives from social ideologies,” he writes, “not from a careful analysis of ecological data.”¹⁸ I think Vale has hit the nail on the head when it comes to understanding the postmodern barrage against wild nature as a whole[k]. It is social

¹⁴ “Piñon” in the original. “Piñon” or “Pinyon” is the common name in English (derived from Spanish) of the various species of pines that produce edible seeds (piñones) that grow in the southwestern United States and in Mexico. Here the author, judging by the region, is probably referring to *P. monophylla* and/or *P. edulis*. *N. of t.*

¹⁵ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

¹⁶ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

¹⁷ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

¹⁸ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

ideology that fires those weapons, not examination of ecological *facts*. Social ideology is also what drives the defenders of commercial logging and extensive cattle ranching who promote the Myth of the Humanized Landscape in order to justify exploitation.

Using archaeology, history, ecology, and logic, Vale examines claims about a humanized landscape for a particular place—Yosemite National Park—in her article, “The Myth of the Humanized Landscape.” He suggests that a place can be said to be “natural” or that it is “in the wild”[1608]¹⁹ if in it the fundamental characteristics of the vegetation, fauna, orography, soil, hydrology and climate are those that result from non-human natural processes and whether these conditions exist whether or not humans are present.”²⁰ Michael Soulé similarly argues: “To claim that *Homo sapiens* has produced or invented forests ignores the basic taxonomic integrity of biogeographical units: species today still have geographic distributions determined primarily by tolerances, ecological conditions, geological history, and climate, rather than human activities.”²¹

Vale explains that claims about a humanized pre-European Yosemite should not be applied beyond the relatively populated Yosemite Valley or encompass the entire area occupied by the national park, and that, even so, slight modifications of vegetation or use of plants does not mean that the valley was completely humanized in native times. Finally, consider the exaggerated claims made about burning by the Indians. He says, “Further examination should ask the extent to which human-induced fires were in addition to, or rather substituted for, natural fires and, furthermore, whether any of the fires set by American Indians transformed the landscape into another different from the one that would have existed without those burnings.”²² After weighing what science knows today about fire frequency and behavior in Yosemite, he finds that “these fire frequencies vary over time, with fires closely following weather conditions - a sign that it is natural factors, not human beings, that determine the frequency of fires.”²³ According to University of Georgia geographer Albert J. Parker, an expert on coniferous forest disturbance, “the predominance of evidence from fire-prone ecosystems ... suggests that fuel accumulation patterns are much more influential than the ignition source in regulating the frequency and spatial extent of fires.”²⁴

Vale also reviews studies from other regions of the United States to learn how widespread the severe human-caused impacts were. He comes to the following conclusion:

The general idea, therefore, is that the pre-European landscape of the United States was not monolithically humanized, it was not a “managed landscape, much of whose

¹⁹ “In a wilderness condition” in the original. *N. of t.*

²⁰ “Red pine” in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

²¹ Page 114.

²² “Chipmunks” in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²³ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁴ “Sweat lodge” in the original. *N. from trans.*

appearance and ecology [were] the product of human presence" (Flores 1997). Rather, it was a mosaic composed, at various scales, of parts wild and parts humanized. The American natural wilderness -primarily environments 27 shaped by nature- existed in fact.²⁵

Vale's edited anthology, *Fire, Native Peoples, and the Natural Landscape*, makes its case based on careful analysis and evidence spanning the entire western United States. His collaborators, who include several of the world's foremost biological geographers and fire ecologists, debunk the romantic (and, as they show, imperialistic) idea that the Indians carried out widespread burning. The regions studied in the book are the Rocky Mountains, the northern part of the region between the Rockies, the Sierra Nevada and the Cascade Range,[m] the Southwest Lowlands, the Northwest Coast[n], the forests of the Sierra Nevada and the California Chaparral. His book is essential to fully understanding the question of whether Indians had already domesticated the United States by the time Europeans colonized the region. Anyone who wants to deal intelligently with the problem of the virgin and the humanized (or the pristine and the profaned, as Soulé calls it) needs to read this book. The authors know what they are talking about; Wilderness deconstructionists[0] - both those on the left and those on the right - who promote the idea of a humanized pre-European landscape are very wrong.

Throughout the West, these experts show that it was lightning-caused fires, not man-made fires, that dominated the fire regime. Advocates of Indian burning base much of their argument on historical accounts. However, William Baker, Craig Allen, and the other authors of *Fire, Native Peoples, and the Natural Landscape* show that early observers largely missed that lightning caused fires. For example, Aldo Leopold wrote in 1920, "As the early settlers[p] knew well, the Indians burned the forests with the deliberate intent of confusing and concentrating game so that it would be easier to hunt them." [1610] Leopold's former settlers did not know what they were talking about, and Leopold remained unclear about the real ecological role of fire throughout his life. Historian Stephen Pyne, widely regarded in the United States as a fire expert and someone who has written much good work, repeats the same misconception, asserting that the most widespread use of fire by the Indians was probably burning to facilitate hunting. Fire and landscape change ecologist Craig Allen, however, counters that "in the Southwest, the idea that hunting fires had a landscape-scale impact rests on grounds that lack the substance of minimal documentation...primary evidence of large-scale burning to facilitate hunting is virtually non-existent in the Southwest and the foundations on which it rests are weak." [1611] Pyne, Charles Kay, and other believers in native pyromania have uncritically relied on a few unsubstantiated claims made by former Leopold colonists and have created a history and prehistory of fire that is ecologically inconsistent.

²⁵ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

Although he writes specifically about the Southwest, what Allen says neatly sums up the situation for the entire West: “Modern claims of extensive Aboriginal burning of Southwest landscapes have been shown to be based on gross exaggerated generalizations and uncritical acceptance of a few historical reports on localized uses of fire.”[1612] Before the Spanish conquest and colonization in the early 17th century, what is now New Mexico was heavily populated by the Pueblo Indians. Allen, who probably understands the paleoecology and current ecology of this region better than anyone, shows that even here[q] the fires were caused by lightning. For example, the Jemez Mountains west of Santa Fe have an extensive network of automated lightning detection devices. This system “recorded 165,117 cloud-to-ground discharges ... during the period 1985-1994.”[1613] This amount does not surprise me in the least since I have been close to being reached on more than one occasion. (One of the best meals of my life was under a Jemez spruce during a terrible lightning storm - my wife, Nancy, roasted some freshly picked boletus in olive oil on our camp stove while we waited for it to clear.). In the Sierra Nevada, a lightning detection network “recorded that lightning struck the Yosemite National Park region approximately 2,000 times a year during the six-year period between 1985 and 1990 (65 strikes per 100 km²⁶ per year)”. [1614]

Although many of those who claim that the Indians tamed the West are well-meaning liberals and pro-social justice, there is also a darker side to this myth. As Craig Allen points out, “perhaps the late 19th century prejudice that Indians set a lot of fires was also related to the ‘Manifest Destiny’ mentality that sought to justify the expulsion of some tribes from their native forest lands”.[1615]

According to Pyne, “Both lightning and people created the elastic pattern that defined the fire regime.” Fire ecologists Tom Swetnam and CH Baisan counter this, saying, “We argue that even if humans had never crossed the land bridge between Asia and North America, historical fire regimes in most Southwestern forests would have remained similar in many respects to the fire regimes we have documented.”[1616] And Allen sums up his exhaustive research (much of which was done on the ground, unlike that of the proponents of Indian burning) as follows: “Numerous lines of evidence from this region overwhelmingly suggest that in AD 1850, as in AD 1580, most mountain landscapes were ‘natural’ and ‘wild’ in terms of fire regimes and associated vegetation patterns.”[1617][1617]

What is really driving this debate? Albert Parker makes it clear:

Discord over the role of indigenous humans in shaping the landscape is motivated by contrasts in the academic roots and ideological affinities of the leading voices in this debate... Evidence refuting that indigenous Aboriginal humans played a pervasive role in shaping the Sierra Nevada landscape comes primarily from physical and biological scientists, foresters, and fire ecologists who have studied late Quaternary paleoenvironments, pre-contact fire regimes, Europeans and the geography of lightning and fires

²⁶ Original title: *The Vanishing face of Gaia*.

caused by lightning. Their evidence is primarily physical and, taken together, offers a logical and consistent history of the links between climate, vegetation, and fire, which have worked to structure the Sierra landscape over the last twenty thousand years. years, or more, mostly without being significantly altered by humans. Evidence in favor of the idea that humans had domesticated the Sierra landscapes comes mainly from experts in human geography and cultural anthropologists...most of the evidence presented in support of this position is ethnographic, based on interviews with elders who lived in the past or present and who descended from the tribal communities of the Sierra.[36]

Parker further notes that this troop feels "a strong need to atone for past sins of aggression and transgression, both cultural and environmental," and has a "political agenda" to "put the Sierra back in the hands of the people." natives, who, in the image of the Noble Savage, were excellent stewards of the land. And he concludes that "nostalgia and political agendas are not valid substitutes for evidence."²⁷ Amen.

Do ecosystems recover from human impact?

According to Arturo Gomez-Pompa and Andrea Kaus: "New evidence from the Mayan region suggests that the apparently natural forests that we are trying to protect from our version of civilization sustained high human population densities and were managed by past civilizations. .. [T]he Maya population of southeastern Mexico may have ranged from 150 to 500 inhabitants per km²[1618] at the end of the Classic Period, in sharp contrast to current population densities of between 4.5 and 28.1 inhabitants per km²⁸ in the same region. . These civilizations of the past seem to have managed the forests to obtain food, fibers, wood, fuel, resins and medicines."^[38]

Part of this is probably true, but the rest of the story, pertinently overlooked by Gomez-Pompa and Kaus, is that the highly overpopulated Mayan civilization grossly overexploited the jungles, and when the drought hit, that bellicose, totalitarian civilization collapsed. .²⁹ For the thousand years since, however, those forests have been recovering. This ecological reality also explains the differences in population density. Jared Diamond discusses the fall of the Mayan civilization in his book, *Collapse*. He says, "It is estimated that the population of central Petén at the height of the Classic Maya period ranged between 3,000,000 and 14,000,000 people, but only about 30,000 people remained when the Spanish arrived."^[40] In other words, the population was reduced by more than 99 percent. These population figures show that the Mayan collapse was due neither to the diseases brought by the Spanish nor to the Spanish conquest, but to the way in which the Mayans "managed" their forests and, because of this, they

²⁷ "Between villages there is a death zone" in the original. *N. from t.*

²⁸ Original title: *The Vanishing face of Gaia*.

²⁹ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

were not able to overcome the drought Gomez-Pompa and Kauz base their claims on social ideology, not ecological facts.

There is a New Wilderness Myth that is common in the writings of wilderness deconstructionists[t]: once the earth is touched in any way by humans, its wildness evaporates[u] and no longer exists. can be restored; therefore, there is no need to protect it from further exploitation by humans. This is the Forest Service's idea of an outdated false idea of purity, which this agency used after the passage of the Wilderness Act³⁰[1620][1621][1622][1623] to try to minimize the amount of land protected as wilderness (I discuss this in more depth in *Taming the Wilderness*[w]). Michael Soulé warns us about this "metaphor for the virgin", "because virginity, like pregnancy, knows no degrees" and is an excuse, therefore, "to justify subsequent material remodeling" of the wilderness.[41] Soulé calls this the pristine- desecrated dichotomy. To cite just one example, a free market theorist used the notion of impure vs. the virgin³¹ to defend the softening of the Endangered Species Law[y].[42]

So, in answer to the question, ecosystems can often recover from human-caused impacts over certain periods of time, depending on the level of impact. This resilience[z] should never be used as a justification for further encroachment into wilderness, but rather provides a valid foundation for concepts of recovery and rewilding[aa] of wilderness.

And finally, is the Myth of Wilderness important to the Idea of Protected Wilderness Areas?

" The pristine vision," according to Denevan,³² "is largely an invention of the romantic and primitivist writers of the nineteenth century." I kind of agree, but I don't think what Denevan calls a "pristine vision" had much to do with the idea of wilderness[bb] that led to the creation of the National Wilderness Preservation System[cc] nor with the motivations of pro-wilderness conservationists in the last eighty-odd years. In 1925, Aldo Leopold noted that "the idea of Wilderness Areas was born after, not before, the normal course of commercial exploitation had begun." [44] So, the father of wilderness protection[dd] made it clear that his idea of wilderness protection[ee] was something new, coming after "motor cars" started encroaching on national forests after the First World War. It has little to do with the "Myth of the Virgin" of "the romantic and primitivist writers of the nineteenth century."

³⁰ "Wilderness Act" in original. US law that regulates the protection of certain natural areas.

³¹ "The fallen-virgin notion" in the original. *N. from t.*

³² In this regard, see also the presentation of "There where man is a visitor" by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

Nor does the New Myth of the Virgin have anything to do with the protection of wilderness[ff] today. Places do not need to be pristine to be declared protected wilderness areas[gg]; the Wilderness Act[hh] has never required a wilderness state.³³ Leopold cleverly explained that “in any practical program, the unit areas sought to be preserved perforce vary greatly in size and *degree of wilderness*” [my italics].³⁴ Senator Frank Church of Idaho was the group leader in 1964, when the Wilderness Act was passed. Ten years later, when the Forest Service “tried to make us believe that no land that had ever been impacted by humans in the past could be considered wilderness, now or ever,” Church responded: “Nothing could be more contrary to the meaning and purpose of the Wilderness Act.”³⁵

The definition of wilderness in the Wilderness Act fully acknowledges that there are few, if any, places that have not been affected by human influence. The Law does not require that the proposed areas have not been touched by humans. And, time and time again, conservationists have had to counter arguments against wild nature[ii] based on lack of purity. Today, the National System for the Preservation of Wilderness Areas has more than 600 areas, totaling more than 107 million acres[jj]. Most of these wilderness areas[kk] were declared protected despite objections from opponents that they were not pure enough.

William Cronon is among those who seem to have misunderstood the Wilderness Act, writing in the early 1990s, “If one sticks to the federal government’s definition, there are no wilderness areas in Wisconsin.”³⁶ False, False, False, False, False, False - six times False: At the time Cronon wrote this, Wisconsin actually had five protected wilderness areas in national forests and one in a wildlife refuge: the Islands Wisconsin, Blackjack Springs, Headwaters, Porcupine Lake, Rainbow Lake, and Whisker Lake. They total 44,170 acres. (In 1978, I testified before Congress on behalf of the Wilderness Society on behalf of the Blackjack Springs and Whisker Lake areas.) All meet the federal government’s definition of wilderness and have therefore been declared protected wilderness areas. And conservationists have proposed that additional[1625] wilderness areas in Wisconsin be protected; as Cronon wrote, Congress was establishing the Gaylord Nelson National Protected Wilderness Area on the Apostle Islands Lake Shore[mm]. The idea of protected wilderness areas contained in the 1964 Wilder-

³³ “Wilderness” in the original. This term refers to lands and ecosystems that are little or not at all humanized. Depending on the context, it can be translated in various ways: “wild lands”, “wild territories”, “wild areas”, wild ecosystems” or, more generally, “wild nature”. In this text it has been translated as “wild nature” except in cases where it is explicitly indicated otherwise. *N. of t.*

³⁴ “Wilderness” in the original. *N. of t.*

³⁵ “Wildness” in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply “wild nature”. Here, except where otherwise noted, it has been translated as “the wild character.” *N. of t.*

³⁶ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

ness Act stems from experience-based conservation management rules[nn] rather than a romantic ideal. I explore the myth of wilderness purity further in *Rewilding North America* and in my forthcoming book *Taming the Wilderness*[oo].

Neither of the two conceptualizations of the "myth of the virgin" -one: that America was virgin before the arrival of Europeans and the other: that only pristine areas can be taken into account when declaring protected wilderness areas- has much to do with the idea of a protected wild area[pp]. I hope I have made the falsity of this myth clear enough so that no one else will ever think of using it again![qq]

I will end this essay with a few words of wisdom from Thomas Vale:

*At the time of European contact there were natural wildernesses and pristine landscapes... They weren't everywhere, that's for sure, but there were places where they were; They existed in some places. To many people this conclusion will not seem novel, but it will be rejected by those who see 'wildernessrr' as a politically incorrect attack on social justice or a strategically stupid ideal to achieve the goals of conservation, or by those who claim that 'nature' is merely a socially constructed category, an artifice of the human mind and language.*³⁷

Grades:

1. WM Denevan, "The Pristine myth: The Landscape of the Americas in 1492," *Annals of the Association of American Geographers* (1992): 369-385.

2. A. Gomez-Pompa and A. Kaus, "Taming the Wilderness Myth," *BioScience* 42, no. 4 (April 1992): 271-279.

3. J. Baird Callicott, "The Wilderness Idea Revisited: The Sustainable Development Alternative," *The Environmental Professional* 13 (1991): 240.

4. C. Whitlock and MA Knox, "Prehistoric Burning in the Pacific Northwest: Human Versus Climatic Influences" in *Fire, Native Peoples, and the Natural Landscape*, ed. TR Vale (Washington, DC: Island Press, 2002), 222-223.

5. D. Dagget, *Gardeners of Eden: Rediscovering Our Importance to Nature* (Reno, NV: University of Nevada Press, 2005). I don't know how they managed to do this without the quasi-divine cattle, which Dagget and his ranching friends hold sacred.

6. ME Soulé, "The Social Siege of Nature" in *Reinventing Nature: Responses to Postmodern Deconstruction*, ed. ME Soulé and G. Lease (Washington, DC: Island Press, 1995), 155-156.

7. Denevan, "The Pristine Myth," 370.

8. DH Uberlaker, "North American Indian Population Size, AD 1500 to 1985," *American Journal of Physical Anthropology* 77 (1988): 291.

9. WM Denevan, ed. Introduction to *The Native Population of the Americas in 1942*, 2[a] ed. (Madison, WI: The University of Wisconsin Press, 1992), p. xx.

³⁷ "Wilderness" in the original. *N. of t.*

10. TR Vale, "The Pre-European Landscape of the United States: Pristine or Humanized?" in *Fire, Native Peoples, and the Natural Landscape*, ed. TR Vale (Washington, DC: Island Press, 2002), 10-31.
11. WR Baker, "Indians and Fire in the Rocky Mountains: The Wilderness Hypothesis Renewed," in *Fire, Native Peoples, and the Natural Landscape*, ed. TR Vale (Washington, DC: Island Press, 2002), 50.
12. D. Foreman, *Rewilding North America: A Vision for Conservation in the 21st Century* (Washington, DC: Island Press, 2004), 25-44.
13. W. Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill & Wang, 1983), 56.
14. TR Vale, "The Myth of the Humanized Landscape: An Example from Yosemite National Park," *Natural Areas Journal* 18, no. 3 (1998): 231-236; this article was later published under the same title in *Wild Earth*, Fall 1999, pp. 34-40.
15. J. Donlan, HW Greene, J. Berger, CE Bock, JH Bock, DA Burney, JA Estes, D. Foreman, Paul S. Martin, Gary W. Roemer, Felisa A. Smith, and Michael E. Soulé, "Re-wilding North America," *Nature* 436 (Aug. 18, 2005): 913-914. (The original title of this article was "Pleistocene Rewilding" but unfortunately the editors of *Nature* changed the title; see also CJ Donlon *et al.*, "Pleistocene Rewilding: An optimistic Agenda for Twenty-first Century Conservation", *The American Naturalist* 168 [2006]: 660-681); C. Barlow, *The Ghosts of Evolution: Nonsensical Fruit, Missing Partners, and Other Ecological Anachronisms* (New York: Basic Books, 2000); PS Martin and DA Burney, "Bring back the Elephants!", *Wild Earth*, Spring 1999, pp. 57-64; P. Martin, *Twilight of the Mammoths: Ice Age Extinctions and the Rewilding of America* (Berkeley, CA: University of California Press, 2005).
16. D. Worster, "The Wilderness of History"³⁸, *Wild Earth*, Fall 1997, p. 10; Worster writes, "I am using the cautious but rigorous estimate by Douglas H. Ubelaker of the Smithsonian Institution, which appeared in his 1988 paper „North american Indian Population Size, AD 1500 to 1985’, *American Journal of Physical Anthropology* 77: 291”.
17. R. Noss, "Wilderness: Now More than Ever"[tt], *Wild Earth*, Winter 1994/1995, pgs. 60-63.
18. CD Allen, "Where Have All the Grasslands Gone? Fires and Vegetation Change in Northern New Mexico", *The Quivira Coalition Newsletter*, May 1998.
19. DR Foster, "New England's Forest Primeval", *Wild Earth*, Spring 2001, pgs. 42-43.
20. D. Foster, "Wild Earth Interview" Interview by Jamie Sayen, *Wild Earth*, Spring 2001, p. 35.
21. Vale, "The Myth of the Humanized Landscape," 231.
22. Vale, "The Myth of the Humanized Landscape," 232.

³⁸ There is a translation in Spanish: "The wild lands of history", in Indomitable Nature:

23. ME Soulé, "The Social Siege of Nature" in *Reinventing Nature: Responses to Postmodern Deconstruction*, ed. ME Soulé and G. Lease (Washington, DC: Island Press, 1995), 157. In a personal email to me, Soulé says that his "statement can be applied to all types of species, except those that have been almost totally eliminated by human trade or transport (including large mammals and other exploited species; as well as many alien species). However, numerically, species whose geographic distribution is not determined by biogeography or ecology are in the minority.

24. Ok, "The Myth of the Humanized Landscape", 232.

25. Ok, "The Myth of the Humanized Landscape", 233.

26. AJ Parker, "Fire in Sierra Nevada Forests: Evaluating the Ecological Impact of Burning by Native Americans," in *Fire, Native Peoples, and the Natural Landscape*, 255-256.

27. TR Vale, "The Myth of the Humanized Landscape," 234, referring to D. Flores, "The West that Was, and the West that Can Be," *High Country News* 29, no. 15 (1997): 1 and 67.

28. CD Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," in *Fire, Native Peoples, and the Natural Landscape*, 162.

29. Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," 162-163.

30. Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," 145.

31. Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," 146.

32. Parker, "Fire in Sierra Nevada Forests: Evaluating the Ecological Impact of Burning by Native Americans," 254.

33. Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," 170-171.

34. Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," 180.

35. Allen, "Lots of Lightning and Plenty People: An Ecological History of Fire in the Upland Southwest," 180.

36. Parker, "Fire in Sierra Nevada Forests: Evaluating the Ecological Impact of Burning by Native Americans," 258-59.

37. Parker, "Fire in Sierra Nevada Forests: Evaluating the Ecological Impact of Burning by Native Americans," 259.

38. Gomez-Pompa and Kaus, "Taming the Wilderness Myth," 274.

39. J. Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Viking, 2005)[uu]; SA LeBlanc and K. Register, *Constant Battles: The Myth of the Peaceful, Noble Savage* (New York: St. Martin's Press, 2003); and R. Wright, *A Short History of Progress* (New York: Carroll & Graf Publishers, 2005).

[uu] There is a Spanish translation: *Colapse*, Random House Mondadori, 2006. *N. of t.*

40. Diamond, *Collapse*, 175.
41. Soulé, "The Social Siege of Nature", 155-156.
42. RT Simmons, "Nature Undisturbed: The Myth behind the Endangered Species Act", *PERC reports*, March 2005, 2-5.
43. Denevan, "The Pristine Myth," 369.
44. A. Leopold, "The Last Stand of the Wilderness" *American Forests and Forest Life* 31, no. 382 (October 1925): 603.
45. The spring 2001 issue of *Wild Earth*, devoted to the theme of the "Wild, Wild East"[vv], should have served to definitively clear up the confusion about wilderness. Particularly noteworthy are: JM Turner, "Wilderness East: Reclaiming History," pp. 19-26; DW Scott, "Eastern Wilderness Areas Act: What's in a Name?", p. 24; and DW Scott, "Congress's Practical Criteria for Designating Wilderness," pp. 28-32. See also Scott's technical memo to Sally Millar, "What Lanass Qualify for Wilderness Designation: A Review of the Wilderness Act and Congressional Precedents," July 23, 2001, distributed by the United States Wilderness Campaign. United[ww]. This memo shatters the myth of the virginity of protected wilderness areas. Scout's latest book also deals very effectively with this topic: see D. Scout, *The Enduring Wilderness: Protecting Our Natural Heritage through the Wilderness Act* (Golden CO: Fulcrum Publishing, 2004).
46. A. Leopold, *A Sand County Almanac* (New York: Oxford University Press, 1949), 189.[1628]³⁹
47. F. Churh, "The Wilderness Act Applies to the East," *Congressional Record-Senate*, January 16, 1973, 737.
48. W. Cronon, "Landscape and Home: Environmental Traditions in Wisconsin," limited reprint, originally published in *Wisconsin Magazine of History* 74 (Winter 1990-1991).
49. TR Vale, "Reflections," in *Fire, Native Peoples, and the Natural Landscape*, p. 300.

³⁹ There is a partial translation into Spanish: *An Ethics of the Earth*, Los libro de la Catarata, 2005. *N. from t.*

Presentation of "CRITICAL AND ALTERNATIVE TO THE IDEA OF WILD AREAS" AND "WILD AREAS, TODAY MORE THAN EVER"

The following is a debate between a critic of the Wilderness concept (John B. Callicott) and one of its defenders (Reed F. Noss). Callicott's arguments are very much the typical arguments postmodern humanists make against the wild. With the peculiarity, however, that this author, unlike other critics of the concept of the wild and as paradoxical as it may seem, really appreciates wild Nature, although he prefers to use the term "biodiversity" erroneously to describe the wild (Biodiversity and wildness do not always go together and it is enough to visit at least some of the European "biodiversity reserves", which Callicott takes and proposes as a reference for protected areas, to realize this; it is possible that in said visit the reader sees in the reserve more surface area made up of industrialized, urbanized, or dedicated to forestry, agriculture, and ranching areas than truly wilderness areas). Some of Callicott's fallacious arguments are quite elaborate (some even seem true and reasonable) and therefore, even if we do not agree with them, we believe that they are worth making known to help intelligent readers avoid falling into simplistic notions. and naive about wild Nature.

For his part, Noss correctly answers most of Callicott's fallacies, although, not surprisingly, he also falls into the typical errors of conservationists, already pointed out in other parts of Wild Nature (see, for example, the Introduction to the section of texts about Wild nature and ecocentric theory [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica>][<http://www.naturalezaindomita.com/textos/naturaleza> -][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica>][[salvaie-y-teora-ecocntrica](http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica)]- or the presentation of "Ecological forest exploitation or protection?" - [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/explotacin-forestal-ecolgica-o-proteccin>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/explotacin-forestal-ecolgica-o-proteccin>][[forestal -ecological-o-protection](http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/explotacin-forestal-ecolgica-o-proteccin)]-]).

CRITICISM AND ALTERNATIVE TO THE IDEA OF WILD AREAS

By J. Baird Callicott¹

I recently gave a talk at a symposium in Bozeman, Montana, in celebration of the thirtieth anniversary of the Wilderness Act² of 1964. I was preceded on the podium by a well-spoken rancher educated at Amherst College, Chase Hibbard, who described himself as a typical redneck³ at this gathering of believers in the idea of wilderness⁴. He declared his love for wild and free beings and his dedication to the stewardship of the lands, private and public, on which cattle graze. He urged us all to seek consensus and find a balance between the preservation of wild ecosystems and economic needs.

When it was my turn to speak, trying to be the skunk at the garden party - a little simile I borrowed (without any attribution) from a text by Dave Foreman that appeared in *Wild Earth* - I began by saying that Mr. Hibbard was a typical redneck. So in one fell swoop I endeared myself to the audience - people can't hate a self-proclaimed skunk - and put them on notice that I might have something disturbing to say. There are two debates about the value of wilderness, I said below. One, which we had just heard about, the one between the preservation of wild ecosystems and the "jobs" (and, I pointed out, the *economic benefits*, which were undoubtedly the most important to Mr. Hibbard, who did not work for a salary, although he never mentioned it in his speech). The other debate - *within* the conservation community, not between conservationists and cowboys - is about the value of the idea of wild ecosystems for the conservation of biological diversity.

As a devoted conservationist and environmentalist, I believe we need to reexamine the commonly accepted idea of wilderness, as defined by the Wilderness Act, "an area where the land and its community of life are free from human-imposed fetters, where man it is nothing more than a visitor who does not remain". I want to stress that

¹ Translation by Último Reducto of "A Critique of and an Alternative to the Wilderness Idea" according to the reprint published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article in *Wild Earth Magazine* 4, No. 4 (Winter 1994/1995):54-59. © 1994 J. Baird Callicott. *N. from t.*

² US law regulating the legal protection of certain areas declared wilderness. *N. from t.*

³ "Redneck" in the original. Although, for the sake of simplicity, it has been translated simply as "redneck" in this text, the concept of "redneck", in English and in the United States, has certain connotations, due to the social and cultural conditions of that country, which make it different from the concept of "paleto" in Spanish. On the other hand, certain non-leftist sectors of US conservationism have proudly claimed for themselves, and not without a certain amount of humor, the adjective "rednecks". *N. from t.*

⁴ "Wilderness" in the original. Term that refers to lands and ecosystems that are little or not at all humanized. In these two texts, unless explicitly indicated, it has been translated as "wild zones", "wild areas" or "wild ecosystems" *N. from t.*

my intention is not to discredit *areas* declared “wild areas”⁵ in order to make them more vulnerable to development pressures. On the contrary, we need to multiply and expand those areas. What I am criticizing here is rather the *concept* of wilderness, that is, how we conceive of the areas we call wilderness. I do so in the hope of reinforcing conservation efforts by helping to base conservation policy on a sound environmental philosophy.

After the existence of an “environmental crisis” was widely recognized in the late 1960s, the benchmark for environmental quality was the ideal of wilderness virginity, untouched nature. Consequently, the new generation of ecologists believed that the best way to preserve nature, if not the only way, was to exclude all human economic activities from representative ecosystems and declare them wilderness protected areas⁶. In them, some primary forests could remain standing, wildlife could have some habitat, etc. In effect, we try to achieve environmental preservation by dividing the planet into zones where destructive human economic activities - such as cattle grazing, mining, logging, agriculture, mechanized recreation, industry and real estate development - would be permitted and areas from which such activities would be excluded. Several recent and not-so-recent discoveries are upending this simple philosophy of nature conservation by preserving wilderness areas.

First, on a practical level, environmentalists of the late 19th and early 20th centuries, such as John Muir, did not articulate the original rationale for wilderness preservation in terms of biological conservation. Rather, they emphasized the ways in which wild ecosystems meet human aesthetic, psychological, and spiritual needs. Wilderness, in short, was originally thought of as a psychospiritual *resource*. Beautiful, quiet and lonely places are often too remote, rugged, barren or arid for farming, logging or even mining. Hence, one of the first criteria for identifying suitable areas for national parks, such as Yellowstone and Yosemite, long before the Wilderness Act of 1964 and public recognition of the environmental crisis, was their *uselessness* for virtually any other purpose. Therefore, as Dave Foreman points out with characteristic candor, much of the declared wilderness is “rock and ice”, great for “admiring the scenery and enjoying the solitude” but not so good for biological conservation.

Second, at the political level, the philosophy of nature conservation by preserving wild ecosystems is defensive and ultimately a losing strategy. The areas in which exploitation is permitted greatly exceed in number and size the areas from which exploitation is excluded. In the continental United States (except Alaska) the area of paved land is greater than that protected in declared wilderness areas. Less than 5 percent of the contiguous forty-eight states enjoy wilderness status, declared or de facto. As the human population and economy grows, the pressure on these diverse wilderness ar-

⁵ “Wilderness” in the original. In this specific case it has been translated as “protected wilderness areas” because here the author refers specifically to the wilderness areas protected by the Wilderness Act. *N. from t.*

⁶ “Wilderness preserves” in the original. *N. from t.*

as becomes ever greater. In the temperate United States, protected wilderness areas⁷, national parks, and designated conservation areas have become small islands in the midst of a rising tide of cities, suburbs, farms, ranches, interstate highways and brushwood. And all of them are being seriously compromised by human recreational use and colonization by exotic species. Large wilderness areas have receded into subarctic and arctic latitudes. Even these remote areas are being threatened by logging, hydroelectric schemes, oil exploration and other industrial encroachments, not to mention the threats posed by global warming and exposure to intensely high levels of ultraviolet radiation. The idea of wilderness, hopefully and enthusiastically popularized by John Muir's celebrated books at the end of the 19th century, has been made obsolete, here at the end of the 20th century, with the pessimism and despair of Bill McKibben's recent bestseller, *The End of Nature*⁸. McKibben's theses need not be expounded here by me as their title says it all.⁹

Third, internationally, the wilderness idea is uniquely American and not a universalizable approach to conservation. However, the environmental crisis and, in particular, the erosion of biodiversity have a global reach. Therefore, we need a philosophy of conservation that *is* universalizable. In Western Europe, conservation through wilderness preservation makes no sense. In India, Africa, and South America, American-style national parks have been created by forcibly evicting resident peoples, with tragic consequences. The Ik, for example, were hunter-gatherers who had lived sustainably since time immemorial in the remote Kidepo Valley of northeastern Uganda. In 1962 they were moved to create the Kidepo National Park, an area where the community of life would henceforth be free from the shackles imposed by man, where man would be a visitor who does not stay. When the Ik were forced to settle in densely populated villages outside the park and farm, their culture disintegrated and they degenerated into that parody of human beings made famous by Colin Turnbull.

Fourth, historically, we are beginning to realize that the idea of wilderness is an ethnocentric concept. The Europeans came to what they called the "new world" and since it did not resemble the humanized landscape they had left behind in the "old world", they thought it was a virgin wilderness¹⁰, on which, as David Brower said, had never been placed on the hands of man. However, the western hemisphere was full of Indians when Columbus stumbled across it. In 1492 the only continental-sized wilderness in the world was Antarctica. The native inhabitants of North and South America, moreover, were not passive inhabitants of forests, prairies, and deserts; they actively managed their land - mainly through fire. Some paleoecologists believe that

⁷ *Idem. N. of t.*

⁸ There is an edition in Spanish: *El fin de la Naturaleza*, Ediciones B, 1990. *N. of t.*

⁹ The title of McKibben's book: *The End of Nature* means "El fin de la Naturaleza" in Spanish and in this book McKibben further develops the idea that, in planet Earth, there are no longer any geobiological zones or processes that have not been affected in some way by human industrial activities. *N. of t.*

¹⁰ "Pristine wilderness" in the original. *N of the t.*

without burning by Indians, the vast and biologically diverse grasslands of North and South America would not have existed, that instead the American hinterlands would have been covered with scrub. Some believe that the North American forests would not have been as rich and diverse without the pyrotechnology of the Indians.

By the 17th century, when English colonists began to settle the east coast of North America, the native peoples had suffered the greatest demographic meltdown in human history. Their populations were reduced by perhaps 90 percent due to the ravages of Old World diseases, which had spread throughout the hemisphere transmitted first from settlers to Indians and then among Indians themselves. So the Pilgrims found a wilderness¹¹ relatively desolate and empty, they lamented themselves, but it was, ironically, a wilderness¹² *artificial* - despite the fact that this combination of words seems like an oxymoron. Europeans inadvertently created the wilderness of the New World lands¹³ through unintended but totally devastating biological warfare against the indigenous inhabitants.

Fifth, at the level of theoretical ecology, there was a time when ecosystems were believed to remain stable unless disturbed, and if disturbed they would eventually return to their stable state, called a climax community. Today it is considered that being unstable and constantly changing, rather than being something exceptional, is its normal state. Therefore, whether we humans interfere with them or not, ecosystems will undergo a metamorphosis. However, the *preservation* of wilderness has often meant freezing the image of the previous status quo, keeping things as they were when "white men" first entered the scene. Thus, the wilderness ideal, *interpreted* in this way, represents a conservation goal that, paradoxically, could only be achieved through intense management effort to keep things as they were. , defying the dynamism inherent in nature.

Sixth, on a philosophical level, the idea of wilderness perpetuates the pre-Darwinian myth that "man" exists apart from nature. Our oldest and most influential cultural traditions have taught us that human beings were created exclusively in the image of God, or that we were uniquely somehow endowed with divine rationality. Consequently, both we and all the essentially supernatural products of our minds were intended to exist apart from and over-against nature. For purist wilderness advocates, encountering any human artifact (except their own) in a wilderness setting¹⁴ spoils their experience of unspoiled wilderness. However, Darwin spread the unpleasant news that our self-exalted human existence is a mere accident of natural selection, no less than that of any other great mammal. We are one of only five living species of great apes. We are, to be frank, only great apes - very precocious ones, to be sure, but apes nonetheless. And everything we do - from bowling or bungee jumping to writing The Iliad or building spaceships (or eco-typing, no doubt) - is monkey business. For many people, the news

¹¹ "Wilderness" in the original. *N of the t.*

¹² *Idem.* *N of the t.*

¹³ "The New World wilderness condition" in the original. *N of the t.*

¹⁴ "Wilderness setting" in the original. *N. from t.*

brought by Darwin was bad news because it seemed to demean us and undermine our noble claims and aspirations. However, I think it was good news. If we are part of nature, then we have a place and role in nature no less legitimate than any other creature - no less than elephants, whales, or redwoods. And what we can do to and in nature - the transformations we impose on the environment - is in principle no better or worse than what elephants, whales, or redwoods can do.

And I say "in principle" since I certainly do not wish to give anyone the impression that I believe that, by the mere fact that we are as natural as all other organisms, everything we do in and to nature-every change we impose on environment- will be good. Most human change is certainly not good. In fact, most of what we do in and out of nature is very destructive.

However, other species, too, can have both beneficial and detrimental effects on the rest of nature. If there were 6 billion elephants on the planet instead of 6 billion people (or, remembering that a full-grown elephant is more than a hundred times heavier than a full-grown human, if there were as much elephant biomass as the current human biomass), the Planet Earth would still be in the midst of an ecological crisis. Elephants, in other words, can also be very destructive members of their biotic communities. On the other hand, the biomass of bees and other plant pollinating insects is probably greater than human biomass (I don't know, I'm not a biologist) and the bee population certainly far exceeds the human population, but the ecological effect of all those bees is undoubtedly beneficial. So if the ecological impact of bee and elephant activities can be both good and bad, why can't the ecological impact of human activities be both good and bad? Measured by the wilderness yardstick, all human impact is bad, not because humans are inherently bad but because humans are not part of nature—or so the wilderness idea takes for granted.

Personally, I hope that those of us wealthy Americans who so desire can continue to enjoy the luxury of respectfully and reverently visiting wilderness areas. In my opinion, the greatest value of the Wilderness Act of 1964 is ethical. It formally recognizes a human commitment to humility, tolerance, and self-control. However, we need to find an alternative to the idea of wilderness as the centerpiece of a philosophy of the *conservation* of nature. Fortunately, we don't need to look very far. We find the appropriate alternative in the concept of biosphere reserves, a concept that emerged in Europe, focused on the tropics and has been approved by the United Nations. Therefore, it has a genuinely international validity. Moreover, biosphere reserves are not selected based on their landscape quality or because they are not useful for anything else, but on the basis of their ecological quality. Said reserves, aimed at preserving biological diversity and ecosystem health, should be designed to house not only charismatic megafauna - bears, wolves, bison and the like - but also the entire spectrum of indigenous species, both invertebrates and vertebrates, both plants like animals.

An invasive human management policy - through, say, controlled burning or carefully planned selective hunting - is cognitively dissonant¹⁵ with respect to the idea of wilderness areas, but not with respect to the idea of wildlife reserves. the biosphere. In fact, one of the significant differences between the old idea of wilderness areas and the new concept of biosphere reserves is an acceptance of compatible human residences and activities in and around reserves. If Kidepo National Park had been conceived as the Kidepo Biosphere Reserve (although, of course, to think that it could really have been that way is an anachronism), the Ik and their culture could have been part of what was preserved. Looking to the future, the idea of a restored Great American Plains—the Bison Commons envisioned by Frank and Deborah Popper¹⁶—suffered from the outset such violent opposition because it was originally launched uncritically on the model of the wild areas. This idea is becoming more politically acceptable, even attractive, as residents of the chosen regions see an opportunity to remain in them, without having to leave them, exchanging cultivation and extensive ranching for various ways of sustainably exploiting bison, the wapiti¹⁷, the deer and the American antelope¹⁸. Just as I envision Bison Commons, private herds of cattle and sheep would be wiped out throughout the arid and semi-arid West. Once domestic livestock are gone, native vegetation could re-occupy the territory. And with the fences taken down, the native ungulates could roam free and wild. Former ranchers and farmers could keep a forty-acre tract as their home¹⁹ and form management cooperatives to divvy up selective hunting rights, perhaps in proportion to how much land each contributed to the common ground. If the Blackfeet, the Arapahoe, the Cheyenne, and the Lakota could exploit the unowned herds of elk and bison without endangering biodiversity, why shouldn't contemporary residents of the same region?

The idea of biosphere reserves can be the centerpiece of a coherent and universalizable conservation philosophy. The idea of wilderness is one of two parts of an “either/or” dichotomy: *either* an area is devoted to settlement and destructive economic exploitation by humans, *or* it is preserved in its pristine state as a wilderness area. In other words, classic wilderness advocates like Roderick Nash envisioned no alternative to wilderness preservation as a counter to industrial civilization. As long as industrial civilization stayed on its side of the fence, it was not questioned.

¹⁵ Cognitive dissonance refers in psychology to the perception of incompatibility due to the conflict between the different ideas, beliefs or emotions of a person, or between their behavior and their ideas, emotions or beliefs. *N. of t.*

¹⁶ Proposal for the creation of a 360,000 km² large nature reserve on the US Great Plains. *N. of t.*

¹⁷ *Cervus elaphus*. *N. of the t.*

¹⁸ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

¹⁹ *Antilocapra americana*. *N. from t.*

The concept of core-buffer-corridor zones of the Wildlands Project²⁰ is based on the new paradigm of biosphere reserves. However, in my opinion, the authors of the 1992 “Wildlands Project Mission Statement” still concede too much to industrial civilization as we know it when they write, “The intense human activity associated with civilization - agriculture, industrial production, centers urban areas - could continue outside buffer zones”. Complementing the idea of a biodiversity reserve in a sound philosophy of nature conservation are the ideas of appropriate technology and sustainable livelihoods - *if* by “sustainable livelihood” we mean the human economic activity that does not compromise ecological health and integrity. Solar alternatives to hydropower and fossil fuels should be intensively explored. Alternatives to industrial agriculture should be promoted through policy changes. Urban sprawl should be controlled through better planning and stricter zoning. Timber stocks should be harvested ecologically and sustainably, as currently mandated by the new Forest Service policy on national forests. Etcetera etcetera. Therefore, part of biological conservation could be integrated into economic activities in areas not declared biodiversity reserves (such as buffer zones and corridors), in the same way that certain economic activities could be integrated into biological conservation in declared areas.

I was struck by the way the Greater Yellowstone Ecosystem²¹ seemed to be an overpowering presence in Bozeman’s collective consciousness. Almost every speaker at the symposium mentioned it. Some lived in it. A few spoke only of him. As it coincided with my Easter holidays²², I reserved some of the following days for trekking. The park attracted me like a magnet. I rented a car and drove up Paradise Valley to the north entrance. So I wandered on foot through the valley of the Yellowstone River and the Lamar and Gardiner, two of its tributaries.

Tired of the long, bleak Wisconsin winter and with my cross-country skis at home, I never got anywhere near the wildest parts²³. Climbing up McMinn Bench near Mount Everts, I could see the park’s headquarters village in the vicinity of Mammoth Hot Springs, the village of Gardiner further north, US 89 heading south into the Norris Geyser Basin, and US 212, which is kept open all winter as far east as Cooke City, Montana. However, the difference between inside and outside the park boundaries was like the difference between day and night. Inside, the office settlement, the roads, the camping areas all had strictly clear borders. And there were no fences. Outside, the gateway town had a long string of gas stations, motels, flea markets, and stalls all along the highway. New-looking houses were scattered here and there on the nearby

²⁰ North American Conservation Project. A central idea of this project is connectivity between protected areas (nuclei) through corridors for wildlife. Another important idea is the creation of buffer areas around the nuclei in which human economic activities would be allowed but would be regulated to favor the conservation of biodiversity in the nuclei. The current name of the project is Wildlands Network. *N. of t.*

²¹ “Greater Yellowstone Ecosystem” in original. *N. of t.*

²² “Spring Break” in the original. *N. from t.*

²³ “Backcountry” in the original. *N. from t.*

crag. Even though I normally walked through a mixture of mud and wapiti dung, the park seemed clean. Beyond, the landscape seemed battered and untidy.

Both outside and inside the park I saw elk, mule²⁴ and whitetail²⁵ deer and pronghorn²⁶. Inside the park I saw quite a few bison. At closer range, evidence of elk overpopulation was ubiquitous: aspens²⁷ were absent, there was a browse line down to elk eye level in the Douglas firs²⁸ and whitebark pines²⁹, animal trails crisscrossed the slopes about every fifty feet³⁰ of elevation, riverbanks were bare and eroded and everywhere he stepped, he stepped on wapiti droppings.

The Greater Yellowstone Ecosystem (containing Yellowstone and Grand Teton National Parks, Bridger-Teton, Targhee, Gallatin, Custer, Caribou, and Beaverhead National Forests and three wildlife refuges, as well as land owned by the Department of Land³¹, state and private) is the largest relatively intact ecosystem in the lower 48 states. The park is on the UNESCO list of Biosphere Reserves and World Heritage Sites. What the Yellowstone Biosphere Reserve lacks is a well-thought-out buffer zone policy and well-articulated corridors to connect it to the Bitterroot, Bob Marshall, Glacier and Cascade core habitats. I have no personal experience of potential corridors, but Paradise Valley is an ideal candidate for a buffer zone on the northern edge of Yellowstone National Park. Under the new ecosystem management ordinance, the Forest Service should manage its “multiple-use” forests as buffer zones for the Greater Yellowstone Ecosystem. Until now, the forest service has extended road building and allowed sloughing on their land, especially in the Targhee and Gallatin National Forests, “treatments” incompatible with managing biosphere reserve buffer zones. Livestock grazing is allowed on nearly half of the ecosystem’s public lands, including (incredibly) designated wilderness areas in national forests and parts of Grand Teton National Park. Still, what hope can we have that the absolutely essential winter habitat for ungulates that make up many of Paradise Valley’s private properties will be managed as a buffer zone?

Let’s look at what is happening in the valley today. With the first can of cold beer I’d had in three days perched on the seat between my legs, my left hand on the wheel and my right taking notes as I drove from Gardiner to Livingston, this is what I saw:

Immediately beyond the park boundaries a large amount of cleared land on the foothills between the Yellowstone River Valley and the mountains has been purchased by the Rocky Mountain Elk Foundation for the purpose of serving as winter refuge. However, some enterprising businessman has dug a gravel quarry visible practically

²⁴ *Odocoileus hemionus*. *N. from t.*

²⁵ *Odocoileus virginianus*. *N. from t.*

²⁶ Another common name for the American antelope. *N. from t.*

²⁷ “Aspen” in the original. Probably *Populus tremuloides*. *N. from t.*

²⁸ *Pseudotsuga menziesii*. *N. from t.*

²⁹ *Pinus albicaulis*. *N. from t.*

³⁰ 1 foot = 30.48 cm. *N. from t.*

³¹ “BLM” [Bureau of Land Management] in the original. *N. from t.*

from the park gate and a stone's throw from the river. As I was driving, a bulldozer was pushing loose rock through a cloud of dust.

The next conspicuous mark of man on the landscape is the former alpine ranch, Royal Teton Ranch, owned by the late Malcolm Forbes, who must not have known that the views from his lodge overlooked the Gallatin Range, not the Teton Range. Forbes, in his last rite of worshiping Mammon³², sold his Montana estate for a handsome sum to the doomsday sect Church Universal and Triumphant. Right on the banks of the river, the hard core of the sect lives in a ramshackle town (and the rest in places like Livingston and Bozeman). Further back, on the slopes of the Gallatin Range, they have built bomb shelters, whose fuel storage tanks were found to be leaking diesel. As he drove at sunset, the cult's cows drank at the Yellowstone and trampled its banks. The former Forbes property just so happens to have geothermal "resources" and I saw steam coming out near the little settlement. The "church" plans to exploit these resources, putting the park's geysers in danger of depletion.

Then, off to the side of the road and away from the river, I passed a "wapití farm", a dilapidated house and some broken-down sheds next to a small grassless corral surrounded by a high fence. I was told that game wardens had ended up trapping the cunning owner as he lured hungry wild elk to his premises at night. He then sold them as captive-bred animals.

Entering Yankee Jim Canyon was a small relief from this wounded world. Most of the canyon belongs to the Gallatin National Forest. In the canyon, the mountains on both sides of the valley come closer together and the river flows fast through a narrow gorge.

To the north, below the breath of Yankee Jim, the valley widens, bordered on the east by the Absaroka Range and on the west by the Gallatin. Once again, ownership is mostly private. Ranches. Cattle. I didn't stay around long enough to know if the Paradise Valley ranchers were conscientious stewards of the land, like Mr. Hibbard, or not. However, what I could see through the windshield at sixty miles per hour³³ was the meaning of "entangled"³⁴ - caught or caught in, or as if in, a net; tangled up; impeded or hindered; confined, according to my dictionary. The valley was "locked," hindered and impeded by a network of fences.

Interspersed with the ranches, near a thick dot on the road map called Emigrant and on to Livingston, are little riverside farms with mansions built on them, owned by wealthy people from elsewhere who found their little piece of paradise on the banks of the river. Yellowstone River. Two miles east of Emigrant, in a large bend in the river, is Chico, a place with hot springs. I didn't stop there as I had just taken an *au naturel* dip in the park.

³² Biblical name for greed and wealth. *N. of t.*

³³ One mile=1,609 km. *N of the t.*

³⁴ "Tramelled" in the original. Here, the author is referring to the passage from the Wilderness Act, mentioned above, in which it is said that in protected wilderness areas, nature has no *obstacles* imposed by human beings. *N of the t.*

To accommodate the itinerant pilgrims in the valley, further down the road someone was readjusting the riverbanks with a bulldozer and building a “camping area” for RVs. The facilities were finished. Just when I passed by, they were building the entrances.

As I got closer to Livingston, the gentrification of the waterfront became more intense. The mountains on either side closed in on each other again until they reached the north end of Paradise Valley, near a place called the Allen Spur. I kept rolling through this town - little by little. The highway is lined with modest houses along the river, lumberyards, gas stations, 7-Elevens³⁵, motels, fast-food restaurants, vacant lots littered with junk—the typical hodgepodge of development not planned fully bare, Anywhere, USA

And what could the valley become? On a Bison Communal Land. Or, more precisely, in a Common Land of Ungulates.

Most cults end up self-destructing - Branch Davidian was a particularly spectacular example. The Church Universal and Triumphant is hopefully no exception to the rule. Then the federal government will be able to do what it has tried before, buy the old Forbes property and turn it over to wildlife.

If the government thought it couldn't afford to pay Forbes' asking price, it would probably cringe at the thought of buying all of Paradise Valley, much of which may not even be for sale. So what can be done? Convincing ranchers to tear down their fences, the most pervasive presence that encumbers the land; get rid of cattle and invite elk, bison, antelope and deer inside. The coyotes would keep the ground squirrels at bay; black-footed ferrets³⁶ would limit the prairie dog population; gray wolves and cougars would weed out the large old, diseased, and less fit herbivores, leaving ranchers to pick the best of the free herds. Wealthy people should love looking out their windows and seeing wild animals free, instead of their neighbors' fenced-in cattle. And tourists might pay even more money to park a Winnebago³⁷ in the middle of “free nature”—as Arne Naess calls this proper mix of people and wildlife—rather than right next to another attraction. side of the road.

However, how to avoid the tragedy of the commons³⁸? Through cooperation. Paradise Valley is well defined and demarcated. A cooperative of ranchers could hire their own expert wildlife ecologists and, in collaboration with the Fish and Wildlife Service, Forest Service, and Park Service, set their own sustainable harvest quotas.

After my talk at the Wildlands Symposium³⁹, I asked Chase Hibbard what he thought of my proposal to switch from cattle ranching to commercial hunting of native

³⁵ Multinational chain of stores. *N. from t.*

³⁶ *Mustela nigripes*. *N. from t.*

³⁷ Famous American motorhome brand. *N. from t.*

³⁸ The tragedy of the commons is the name commonly given to the situation in which a freely accessible common resource is individually exploited. The result, in the absence of an authority to effectively regulate such exploitation, is often over-exploitation and depletion of the resource, as each individual party tries to obtain maximum profit by intensifying exploitation. *N. from t.*

³⁹ “Wilderness” in the original. *N. from t.*

ungulates. He was against her. categorically. I asked him why, since market analysis suggests that such a program would be more economically attractive than cattle ranching. “You know, business is business. Or are cattle a religion in Montana? “Yes”, he replied, “it is”. (This symposium was full of surprises). And he went on to deliver the usual string of bullshit⁴⁰ about how cattle are part of what makes the West the West (in Hollywood-mediated American minds), and how his family has been raising cattle there for a long time. “A long time!” I wanted to say, but stopped—a moment in the trajectory of the true history and future of the West, which belongs to the bison and those whose livelihood was once centered, and it may soon be again, in these shaggy symbols of the semi-arid highlands of North America and in the other native herbivores.

Thinking back on this exchange of views, I came to the conclusion that cattle were not the true object of worship in the Western rancher religion. Private property is. Other than the Church Universal and Triumphant, Paradise Valley is no home for the new worshipers of Baal⁴¹. No, the ranchers’ theologian is John Locke⁴². As I envision the Paradise Valley Commons—a key part of the Greater Yellowstone Biosphere Reserve’s Buffer Zone—“true” private property will remain in private hands. It is privately owned “animal units” that would disappear, along with fences, one of whose purposes is to mark property boundaries and separate private herds from each other.

Would this be such an anti-American thing? Not if we think more broadly, in historical terms. That’s more or less the way the Indians - and if anyone can say he’s a real American it’s them - did it. Each group had a territory over which they claimed and asserted their property rights. But the animals were their own masters. And if, to sound closer, we have to limit ourselves to the short-term scale of Euro-American history, traditionally, pelagic fishermen have owned their own boats and gear, but the fish went where they wanted, without anyone would possess So the precedent and paradigm of an Ungulate Commons should perhaps be marine fisheries rather than terrestrial ranches. With one big difference: a network of North American Ungulate Common Lands would be much less prone to overharvesting, as the stocks are made up of large, conspicuous specimens that are fairly easy to count and fall under national jurisdictions (those of the United States). United States, Canada and Mexico, today, for better or worse, coordinated by NAFTA⁴³).

⁴⁰ “The usual line of bullshit (pun intended)” in the original. This phrase in English plays with the double meaning of “bullshit” (literally “dung”, although it is normally used with the meaning of “nonsense”), to make fun of what the rancher was saying, and explicitly points it out in the parentheses. These humorous details are impossible to translate. *N. from t.*

⁴¹ God of ancient Asia Minor mythology, associated with rain and fertility. The author metaphorically refers to those who defend wild Nature. *N. from t.*

⁴² In reference to the idea that private property is a natural right of the human being defended by this 17th century philosopher, considered one of the fathers of liberalism. *N. from t.*

⁴³ North American Free Trade Agreement. *N. from t.*

The concept of conservation through biosphere reserves includes another zone that is often less commented on, the transition zone. Here too, the key is appropriate technologies and sustainable economies. Starting in Livingston and going east, the mountains of Montana give way to the high plains of Montana. The Great Plains region is already moving in the direction of the Bison Commons. The fences are still standing, but several large ranches - most famously owned by Ted Turner - are trading cattle for bison. Although bison are certainly less easy to manage and more difficult to contain, they require less care than cattle, so they are becoming an increasingly attractive alternative for imaginative high plains entrepreneurs with enough land. And many Indian groups are showing a keen interest in repopulating reservation lands with bison herds, with the added incentive of bison's place in their histories, cultures and religions.

WILD AREAS, TODAY MORE THAN EVER. A RESPONSE TO CALLICOTT

By Reed F. Noss⁴⁴

J. Baird Callicott's article "Criticism and Alternative to the Wilderness Idea" is peculiar. It's well-written, scholarly, and definitely thought-provoking. However, it also causes a fair amount of frustration, at least for me. Many of us involved in the conservation movement have worked hard for years to promote ecological and evolutionary understanding as a logical foundation for the conservation of the earth (land in Aldo Leopold's sense of the term, including air, soil, water and biota), although always linked to the aesthetic and ethical appreciation of wild beings and places for themselves. Following Leopold, we have tried to unite the brain and the heart, rationality and intuition, in the fight to defend wild nature. Yet now comes Callicott, a renowned environmental ethicist, a student of Leopold's ideas, and an outspoken lover of the wild⁴⁵, launching an attack on the concept of wilderness. This is just the latest in a series of articles in which Callicott dismisses the idea of wilderness as anachronistic, ecologically uninformed, ethnocentric, historically naive, and politically counterproductive. I think Callicott is completely wrong and I'm going to try to show you why.

First, I must emphasize that I agree with much of Callicott's essay. His progressive interpretations of biosphere reserves, buffer zones, transition zones, sustainable livelihoods and ecological stewardship are all in the same vein as what I and the many others affiliated with the Wildlands Project have supported. and proposed. Yet Callicott presents all of these integrative concepts as alternatives to wilderness protection, as things conservationists should spend their time on instead of defending wilderness.

⁴⁴ Translation by Último Reducto of "Wilderness-Now More than Ever" according to the reprint published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article in *WildEarth* magazine 4, no. 4 (Winter 1994/1995):60-63. © 1994 Reed F Noss. *N. from t.*

⁴⁵ "Wildness" in the original. *N. from t.*

To support his view that the wilderness idea no longer has value, Callicott constructs a straw man from a wilderness idea (essentially based on the Wilderness Act of 1964) that is thirty years out of date. No one I know today thinks about wilderness in the way that Callicott describes. Anyone with a bit of brain knows that the boundaries of wilderness areas are permeable, that ecosystems are dynamic entities, that humans are ultimately part of nature (although one might doubt whether we are not an evil part) and that ecological management is essential in most modern wilderness areas if we are to maintain biodiversity and ecological integrity. "Letting nature take its course" in small, isolated reserves with increasing numbers of exotic species and uncontrolled herbivores is passively watching while an accident victim bleeds to death.

Callicott asserts that "several recent and not-so-recent discoveries are upending this simple philosophy of conserving nature by preserving wilderness areas." And he goes on to offer various arguments in favor of his thesis that the ideal of wilderness is no longer useful. I agree that "untouched" wilderness areas in human-dominated landscapes often have minimal ecological value. But they still have some value, for example, serving as reference sites (albeit imperfect) for restoration and management experiences and as micro-refuges for species sensitive to human disturbance. It is an exaggeration to say that wilderness preservation has failed. In fact, judging by the recent evidence available in most of the continent, one could more easily conclude that it is the management of multiple uses that has failed. Multiple-use areas, which make up the vast majority of public lands, have been much more degraded than virtually any of our protected wilderness areas⁴⁶ (Callicott himself offers several examples from the Greater Yellowstone Ecosystem) . Highways criss-cross everywhere, the last old growth forests are being planked, cows chew their cud and shit as they make their way through public pasture lands, and "ecosystem management" propaganda is used to justify maintaining status quo under a new guise. This evidence only reinforces the idea that we need more - not less - land area off limits to intense human exploitation. The more the landscape in general is degraded, the more valuable true wilderness areas become, despite the fact that they are increasingly difficult to protect.

Callicott is absolutely right that in his day biological conservation was not one of the main reasons for declaring wilderness areas protected. The skewed location of lands declared protected wild areas - areas of low economic value are protected, except for recreation and tourism, instead of more productive and biodiverse areas - is well known. This distorted and unecological approach to wilderness protection has been repeatedly denounced in both technical conservation writing and popular conservation literature. Modern conservation programs, from conventional government projects such as the National Agency for Biological Research's Gap Analysis⁴⁷ to cutting-edge attempts such as the Wildlands Project, are attempting to correct this imbalance and account

⁴⁶ "Wilderness areas" in the original. *N. from t.*

⁴⁷ "National Biological Survey's Gap Analysis" in original. It refers to an official project that later became carried out by the Biological Research Division of the US Geological Survey. *N. from t.*

for better the full spectrum of biodiversity in protected areas. On this issue, Callicott's criticisms of the wilderness movement are dishonest; We have learned and we have matured. We will no longer tolerate the sacrifice of productive wilderness in exchange for a few chunks of rock and ice. Callicott's claim that wilderness preservation is purely "defensive" is simply a reflection of the attacks on wilderness⁴⁸ everywhere. Of course we are defensive. If we didn't defend the last remaining wilderness⁴⁹, they would soon be gone. And still we lose most of the battles; if we surrendered, before long there would be nothing left. Be that as it may, the wilderness defense movement today is not merely defensive. In fact, the Wildlands Project aims to overcome defensive and desperate attempts and move from saying what should not be done to saying what should be done to restore entire ecosystems in all regions.

Callicott devotes quite a bit of space in his essay to the problem of excluding humans from wilderness when humans are actually part of nature. I know of no more difficult philosophical problem than the question "what is natural." Damn me if I know. However, Callicott does not contribute much to the resolution of this matter either. I agree that it was a mistake to extend the standard US model of national parks to developing countries and exclude indigenous hunter-gatherer cultures from those areas. The idea that wilderness can include all primates except the *Homo* genus is ridiculous. However, it is not ridiculous to prevent people leading wasteful, subsidized, unsustainable, industrial lifestyles (including Callicott and myself) from permanently inhabiting protected wilderness areas⁵⁰. Even excluding "native" peoples from some reservations is not ridiculous when these people acquire firearms, snowmobiles, ATVs, bulldozers, and modern medicine. It is not the exclusion of these reserves that separates us from nature; it is our culture and our ways of life, which had already separated us from it long before we started declaring wilderness areas protected. Yes, the Darwinian revolution united us intellectually with nature; But we've been trying our best to emotionally and physically separate ourselves from nature since Neolithic times (at least).

The problem with our distance from nature may lie in the increasing preponderance of cultural evolution over biological evolution in the last millennia of our history. This split between the cultural and the biological also requires that we take steps to protect wilderness⁵¹ and other species from exploitation by humans if they are to survive. The adaptations of most species are determined by biological evolution acting through natural selection. Except for bacteria and some species of invertebrates that have very short "generations", biological evolution is much slower than cultural evolution, taking hundreds or thousands of years to express itself. Through cultural evolution, humans can respond much faster than most other species to environmental change. Since most environmental change today is human-made, we have created a situation in which

⁴⁸ "Wild areas" in the original. *N. from t.*

⁴⁹ *Idem. N. of the t.*

⁵⁰ "Wilderness areas" in the original. *N. from t.*

⁵¹ "Wild areas" in the original. *N. from t.*

our short-term survival is much more assured than that of less adaptable species. Some of those species are extremely sensitive to human activities. As I understand it, the environmental ethic, as Leopold, Callicott and others have called it, obliges us to protect those species that depend on wilderness as they are sensitive to persecution and siege by humans. . I hasten to say that few species "depend" on wilderness because they prefer wilderness to human-occupied land; rather, they need the wilderness because humans exterminate them everywhere else. The absence of roads defines the wilderness. Where there are roads or other means of access for humans, large carnivores and other species vulnerable to human persecution will normally not be able to survive.

Callicott rightly criticizes the idea of wilderness as landscapes that are "unmanaged" at all. I disagree with some modern wilderness advocates in emphasizing that most protected wilderness areas⁵² today must be actively managed if they are to maintain the "natural" conditions for which they exist. they were declared protected (see my book, co-authored with Allen Cooperrider, *Saving Nature's Legacy: Protecting and Restoring Biodiversity*, Island Press, 1994). Certainly the Native Americans managed the ecosystems in which they lived, mainly through the use of fire. I think there is clear evidence that up to a certain level of management, *Homo sapiens* can be a true "key species" in the most positive sense; that we can enrich the diversity of habitats and species in the landscape. We can play a role similar to that of beavers, prairie dogs, bison, woodpeckers or burrowing turtles⁵³, providing the habitats many other species depend on. Above a certain threshold, however, biodiversity enhancement turns into biodiversity destruction. Diversification becomes homogenization. The man who was part of nature goes to war with nature. We get too devilishly smart for our own good. I don't think human management or technology is inherently bad; but once we have crossed the threshold, we become a tumor instead of being a vital part of the ecosystem. Once again this transformation constitutes another reason to establish protected wilderness areas⁵⁴ and protect them from human encroachment. These wilderness areas may need to be managed, but the most positive management will usually be protection from overuse by people, restoration of structures and processes damaged by past human activities, and management of disturbance (for example, artificial burning⁵⁵) to replace natural processes that have been altered.

Callicott's Wilderness Strawman reaches its zenith with the assertion that "the *preservation* (italics his) of wilderness has often meant freezing the image of the prior status quo, keeping things the way they were when 'white men' first came on the scene". Although logically consistent, such an interpretation of the wilderness ideal is stupid. No ecologist interprets wilderness in the sense of static, pristine climax with which Callicott caricatures it. In any case, throwing away knowledge of the pre-European historical state of North American landscapes would be just as stupid. These pre-colonization

⁵² "Wilderness areas" in the original. *N. from t.*

⁵³ *Gopherus polyphemus*. *N. from t.*

⁵⁴ *Idem*. *N. of the t.*

⁵⁵ "Prescribed burning" in the original. *N. from t.*

ecosystems developed over thousands and even millions of years of evolution of the species that made them up without significant human intervention [except for the possible role of human hunters in eliminating many of the large mammals. North Americans between 10,000 and 15,000 years ago]. It is true that the environment in which these communities developed was dynamic, but the pace and magnitude of change were nothing like those experienced today. As ecologists Steward Pickett, Tom Parker and Peggy Fiedler point out (in *Conservation Biology*, edited by PL Fiedler and SK Jain, Chapman and Hall 1991) in relation to the “new paradigm of ecology”, the knowledge that nature is essentially a changing mosaic in continuous flux should not be misconstrued to suggest that human-generated changes are not something to worry about. On the contrary, “the changes generated by the human being must be restricted because nature has functional, historical and evolutionary limits. Nature has a range of modes of being, but there is a limit to these modes, and therefore human changes must be within those limits.

Yes, many North American ecosystems were managed by burning by Indians for perhaps as long as 10,000 years; but in most cases, the Indians did not create new ecosystems. They simply maintained and expanded the grasslands and savannahs that developed naturally during climatic periods when fire frequency was high. Furthermore, the importance of the fires set by the Indians is often exaggerated. As many ecologists have pointed out, the natural frequency of storms in some regions, such as the coastal plain of the southeastern United States, is more than sufficient to explain the dominance of pyrophytic vegetation there. In any case, Native Americans, in most cases (leaving aside the megafaunal extinctions of the late Pleistocene), clearly acted more within the functional, historical, and evolutionary limits of their ecosystems than Europeans, who transformed the most of the North American continent in less than 200 years. The modern idea of wilderness, as conceived in the Wildlands Project, does not say that humans are apart from nature. It simply says, along the same lines as Leopold’s land ethic, that we need to place restrictions on our actions. We need to stay within the limits set by the evolutionary histories of the landscapes we inhabit. Until we manage to reduce our numbers and humbly walk everywhere, let us do the latter at least within the wilderness⁵⁶ that we have left.

Callicott presents the biosphere reserve model as an alternative to protected wilderness areas⁵⁷. I agree that the biosphere reserve model is useful - we [the Wildlands Project] base our wilderness network proposals on an extension of that model. Biosphere reserves are not, however, an alternative to protected wilderness areas⁵⁸. In fact, protected wilderness areas⁵⁹ are the central part of the biosphere reserve model: the core areas. Without a core of wilderness, a biosphere reserve would not be able to fulfill its function of maintaining the full range of native species and natural processes.

⁵⁶ “Wilderness areas” in the original. *N. from t.*

⁵⁷ “Wilderness” in the original. *N. from t.*

⁵⁸ *Idem. N. of the t.*

⁵⁹ *Idem. N. of the t.*

A core wilderness area may still require ecological management, especially if it is too small to care for itself (less than several million acres). A healthy long-term goal is to rebuild core areas (ideally there should be at least one in each ecoregion) large enough to be essentially self-managing, areas that don't require our constant care and vigilance. Those true wilderness areas will have a lot to teach us about how we might live in harmony with nature in the buffer zones.

Callicott's alleged dichotomy of "either an area is dedicated to settlement and destructive economic exploitation by humans, or it is preserved in its pristine state as wilderness" is false. The reserve network model applied by the Wildlands Project recognizes a gradient from wilderness to developed land, but promotes continued movement toward the wild end of the gradient over time as the scale and intensity of activities increase. humans decline. And human activities must decline if we want the Earth to have any future. Callicott's idea of "sustainable livelihoods" is fully consistent with this model. However, how are we to know how to manage resources sustainably (while sustaining all native species and ecological processes) without wild areas to serve as benchmarks and models? How are we going to show restraint in our stewardship of resources within the landscape as a whole if we don't have enough respect to leave large areas of wilderness undeveloped for their own good?

We don't need alternatives to wilderness. Rather, we need to incorporate the wilderness ideal into a broader vision of reclaimed yet dynamic landscapes in which wilderness dominates, but is complemented by true civilization. As Ed Abbey said, a society worthy of being called a civilization is one that recognizes the value of leaving much of its land to the wild⁶⁰. In these days of frivolous "ecosystem management," we need the wilderness ideal more than ever. We need it to have a 'database of normality', as Leopold called it, to provide us with benchmark sites against which we can compare more intensively managed lands. We need it to inspire us, to put our lives on the line, to humble us. And, more importantly, the bears need it too.

⁶⁰ "Much of its land as wilderness" in the original. *N. from t.*

Presentation of “ECOLOGICAL FOREST EXPLOITATION OR PROTECTION?”

The following text, like several others published in Wild Nature (such as: “Against the social construction of wild nature” by Eileen Crist -

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/contrala-construccin-social-de-la-naturaleza>][<http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/against-the-nature>][social-construction-of-nature-] or “The authentic idea of Wild Nature” by Dave Foreman [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-autntica-idea-de-la-naturaleza-salvaje>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la->]

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-autntica-idea-de-la-naturaleza-salvaje>][autentica-idea-de-la-naturaleza-salvaje-]), is yet another refutation of certain humanist arguments against the concept of Wild Nature.

The author, following the line of most conservationists, commits the same typical errors: idealism and ignorance of the functioning of the factors that really influence the development of human social systems (proposes as the ultimate goal the establishment of an “environmentally friendly” society). harmonious”, without taking into account that it is simply impossible to plan and direct the future development of a society); focus on the legal protection of Nature (although it is clear that, in the long term, legal protection is not going to be enough to save what remains of wild Nature); and forget that there is a different option from legal protection in the short term and the idealistic defense of ecologically “harmonious” utopias in the long term: the elimination of the techno-industrial society.

To all this should be added the idealistic unrealism involved in the proposal that today’s primitive peoples continue to live in a totally primitive way in protected natural spaces. It is completely true that no matter how “aboriginal”, “native” or “indigenous” their ancestors were and no matter how much they try to keep alive some of their cultural traditions, the vast majority of descendants who live today in the occupied areas Traditionally, their people lead a modern and industrial way of life that does not differ in any essential way from that of the rest of the human population that occupies

other more developed areas of the planet. And therefore, its ecological impact is similar to that of any other human being today. However logical and desirable the proposal to restrict human residence in protected areas to people with a traditional way of life, without modern technology and with low population densities may seem, it will not work. And, to a large extent, it will not work because the natives themselves who have already had contact with modern society (which are already the vast majority today) will not want to live in primitive or traditional conditions. Tell an Eskimo, for example, that in order to continue living in the protected area traditionally occupied by his tribe, he will have to give up rifles, snowmobiles, or outboard motors (not to mention houses with electricity and heat, the TV, medical assistance, packaged food or state subsidies). It will simply send them to hell! So, in reality, if you want to legally protect an area, there are only two realistic options: kick these people out of that protected area (with all the social and ethical problems that this entails) or let them stay (with all the negative impact). and the ecological problems that this entails).

However, these theoretical defects of the author do not affect the validity of his refutations of the philosophical arguments against the concept of Wild Nature, and this is the reason why we consider this text worthy of publication.

ECOLOGICAL FOREST EXPLOITATION OR PROTECTION? A FEW WORDS IN DEFENSE OF THE PARKS

By Ken Wu¹

During the 1990s, the tremendous development of the environmental movement has been accompanied by many changes within the movement, many for the better but some for the worse. Among the changes for the worse is the growing tendency among activists to play down the need to establish parks and protected areas. Many of these individuals and groups are either fighting wilderness destruction in a vacuum[376], that is, with no clear alternative to such destruction, or are promoting “green logging”² and other supposedly benign and ecological forms of resource extraction. I hope I can show you here that anything other than a call for the protection of priority wilderness areas

¹ Translation by Último Reducto of the reprint of the article “Ecoforestry or Protected Status? Some Words in Defense of Parks”, published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed

² “Ecoforestry” in the original. Although “forestry” is usually translated as “silviculture”, its meaning is broader than the mere cultivation and care of tree plantations (silviculture), including any type of forest exploitation, both tree plantations and spontaneous forests. On the other hand, the term “ecoforestry” refers to a current that defends the use of alternative methods in forest exploitation in order to make it supposedly ecological and sustainable. It is also known as “selective logging” (“selection forestry”) or “restoration forestry” (“restoration forestry”). For all these reasons, in this text “ecoforestry” has been translated as “ecological forest exploitation” in all cases. *N. from t.*

is detrimental to indigenous biodiversity. I will examine the main arguments against establishing parks that some environmentalists make and the strategic consequences of not defending parks.

A rebuttal to some of the main arguments against parks

Much of the lack of support for protected areas can be attributed to ignorance. Many activists simply do not have an overview of the state of North America's threatened ecosystems and are unaware that the ecosystems that are healthiest and safest from environmental destruction are parks and protected areas. Therefore, they do not understand the importance of acting in favor of legal protection, instead of in favor of mere moratoriums on destruction, which usually end up being annulled later.

However, what needs to be more vigorously contested are the philosophical critiques of parks and protected areas, as the development of such environmental arguments against wilderness³ is on the rise, as exemplified by the essay by William Cronon, "The Trouble with Wilderness"⁴, in the recent anthology *Uncommon Ground: Toward Reinventing Nature*. Dave Foreman, David Johns, George Wuerthner, Mike Matz and Reed Noss have already responded to many of the criticisms of the concept of wilderness and protected wilderness⁵ in the Wildlands Project anthology⁶, *Place of the Wild*, as well as *Wild Earth*, so there is no need for me to repeat their rebuttals. However, I would like to add a few thoughts of my own, as I believe it is crucial that such misguided criticism of parks (the most common designation for protected wilderness⁷ in Canada) be refuted once and for all. before they gain more weight in the movement. The environmental arguments against protected areas, and my responses, are as follows:

1. The concepts of park and protected wilderness area⁸ separate human beings from nature when, in fact, human beings are part of nature. Parks therefore reinforce the man/nature dualism of Western civilization.

Of all the arguments against protected areas, this is the one that takes the cake for being thoughtless and clearly illogical. That human society *should be* in harmony with nature does not mean that it *is* in harmony with her - we are very far from it, hence the global environmental crisis. There is a difference between what *should be* and what *is*. Certainly, industrial society, with its cars, factories, DDT and shopping malls, is not one with nature and it is not by using the expression *wildlands* that we are somehow creating a dualism; that dualism already existed. There is a huge difference between a parking area and a meadow, between a clear-cut area and primary forest. Human civilization had already separated itself from nature, from the wilderness; what needs to be done is to bring human beings back into harmony with nature by developing

³ "Antiwilderness" in the original. *N. from t.*

⁴ "The problem with wild nature". *N. from t.*

⁵ "Wilderness concept and wilderness areas" in the original. *N. from t.*

⁶ The Wildlands Project was an American conservation organization. It is still active today, although it is called the Wildlands Network. *N. from t.*

⁷ "Wilderness" in the original. *N. from t.*

⁸ *Idem.* *N. from t.*

an environmentally harmonious society and protecting nature in the wilds of parks *while the industrial society still exists*. Wilderness defenders did not create the human/nature dualism; agriculture, technology, and industrial society did so by destroying nature and thereby creating an obvious separation between the wilderness and human society. We have to recognize this dichotomy between wild nature and civilization if we want to overcome it. Creating parks, protecting the nature that people are supposed to be a part of, is the most important step in transcending that dualism.

2. What is needed is “ecological logging” and environmentally harmonious lifestyles and practices, not more parks. It is not human beings per se that are to blame, but rather the ways in which we live that are destructive.

Ok ! Hunter-gatherer lifestyles have allowed the ecosystems in which they occur to remain more or less intact. It could be said that such ways of life are environmentally harmonious. However, organic logging, permaculture and organic farming, with their use of today’s advanced technologies and today’s human overpopulation, have little to do with hunter-gatherer ways of life.

In ecological forestry, a large number of trees are extracted and used to produce wood, depending on the annual growth of the forest. This collides with the small number of trees that the hunter-gatherers cut down (when they cut any) to make a raft or build their house. Indeed, where slash-and-burn agriculture is also practiced in addition to hunting and gathering, as in many tropical indigenous cultures, many more trees are removed. This may indicate the beginning of a mainly agricultural way of life for these peoples, which will certainly be destructive, as all agriculture is. Agriculture is the destruction of the native organisms of an area and their replacement by one or a few species useful to humans.

In these *mainly* hunter-gatherer societies, however, clearings occupy only tiny fractions of the forest cover, which are quickly reclaimed by the forest when small cleared plots are abandoned after a couple of years. . By contrast, through selective felling and commercial thinning, which are far more practical possibilities than ecological logging in an industrial society, trees can be harvested in quantities that far exceed annual growth, at which point the internal conditions of the forest are degraded. In addition to the removal of trees, the problems of road construction, habitat fragmentation, soil compaction, erosion, damage to watercourses and the introduction of exotic species increase even with the practice of extraction. selective logging⁹. Nor should the indigenous custom of burning down patches of forest to provide better grazing for the ungulates they hunted be used to justify alternative forestry practices. More and more studies are revealing differences between logged and burned areas (Noss 1993), such as soil chemistry, successional species composition, and the presence of defoliation gradients in burned but not overgrown areas. felled. Clearly wilderness and areas used for logging are not the same thing. Ecological logging may be necessary in areas not

⁹ See footnote 3. *N. from t.*

suitable for protection, but such practices are not appropriate everywhere and do not replicate natural processes.

Some opponents of protected areas cite the example of indigenous peoples who lived in harmony with nature to deny the need for protected areas where human residence is prohibited. Okay, so let's protect areas where native hunter-gatherer tribes are included and protected. Most wilderness advocates would support indigenous hunter-gatherers continuing to live in protected wilderness¹⁰ as long as those native peoples possessed traditional technologies and population levels (as is the case of some tribes in the tropical zones of Africa, Asia and South America). In contrast, few protected area advocates would support native peoples with industrial technologies and larger populations extracting resources in protected areas, especially for commercial purposes. This is where ecocentric ecologists often diverge from more anthropocentric ecologists, who support Native peoples using chainsaws, bulldozers, rifles, steel traps, and snowmobiles to extract resources from proposed protected areas. Support for native hunter-gatherer lifestyles does not invalidate the need to protect those areas. Rather, it is a justification for protecting those areas worthy of protection that contain hunter-gatherers.

Proponents of native sovereignty may question the notion of native peoples living in parks controlled by colonial governments, both here in North America and elsewhere in the world. Native sovereignty may be a legitimate right; however, in the meantime, until current governments are pressured to accept native sovereignty or are deposed, it does neither the environment nor native peoples any good to have multinationals destroying wilderness. Parks are the best way to avoid it in today's society.

3. The crucial task is to change society to be environmentally harmonious, not to create more parks that exist alongside the consumer society without questioning its fundamental basis. Industrial society will eventually destroy protected areas anyway through pollution (depletion of the ozone layer, greenhouse effect, acid rain, etc.) and opening park boundaries in times of resource scarcity.

This is a criticism used by both reformers and radicals. Its two main problems are that it confuses means with ends and that it is strategically flawed. First, from an ecocentric perspective, the continued existence of the Earth's natural biodiversity as a whole is the most important goal. To achieve this goal, we must advocate *both*, the protection of this biodiversity in wilderness parks - a concrete means that is also identical to the end - and the establishment of an environmentally harmonious society so that pollution and population growth do not destroy protected areas and the rest of nature. Therefore, when new environmental laws are required to regulate logging practices or curb pollution or, more fundamentally, when working to dismantle industrial society, this is done to ensure the long-term security of protected areas and of all species, including humans. However, critics of protected areas, believing that the main task is the survival of the human species, see no reason to protect wild lands; a world with

¹⁰ *Idem. N. from t.*

the basic necessities for survival - clean water, air and soil, and renewable agriculture - assured is all that is needed to guarantee human existence. The existence of the vast array of global biodiversity in functioning ecosystems (some species may be stored in gene banks) is not, for the most part, a necessity for human survival; the view of the Earth as a garden, as Roderick Nash (1982) critically calls it, is considered sufficient.

For some critics, the reform or replacement of industrial society is the crucial task to ensure human existence, while the protection of wilderness is simply a means of "saving the planet", meaning ensuring non-human existence. Such people have mistaken the means of creating a green society for the purpose of securing wilderness.¹¹

In addition to being anthropocentric, his critique is strategically weak. If, as many of the confused critics of the parks claim, you have to change society first even though protecting more wilderness¹² is a great thing, then by the time the revolution succeeds it will be too late for most of the areas and wild species. Right now, most parks and wilderness areas¹³ in the United States and Canada are surrounded by agricultural fields, clearcut areas, and urban areas. If it weren't for the protective measures, these natural areas would have been destroyed long ago.

4. Our parks have failed miserably to stop the loss of biodiversity. Most of the parks, which are too small to begin with, are situated in high-altitude areas composed of ice and rock that are unsuitable for other uses by humans, while the most productive and diverse ecosystems at lower altitudes are largely left unprotected. In addition, the parks have been subjected to industrial tourism, which has destroyed much of their biotic integrity.

As George Wuerthner (1994) has pointed out, "Just because our current reservation system doesn't work as well as it should, doesn't mean it doesn't work." Just because our parks are too small to support healthy populations of all species doesn't mean we shouldn't defend the parks; it means we must fight for bigger parks, like the one proposed in the Northern Rocky Mountain Ecosystem Protection Act.¹⁴ Just because parks are rarely established in old-growth forests or grasslands doesn't mean we should stop advocating for parks; it means that we must work so that primary forests and grasslands are protected. For example, here in British Columbia, tremendous public pressure for old-growth forests to be protected has resulted in recent years in substantial tracts of magnificent low-lying old-growth forests being protected: the forests of

¹¹ "To some critics, wilderness protection is simply a means to 'save the planet,' meaning to secure human existence, while the reform or replacement of industrial society is the most crucial task for ensuring human survival. Such people have confused the means of creating a green society to secure wilderness with the ends" in the original. Given the inconsistency of the original text, it seems that the author was not very adept at clearly expressing his ideas in this paragraph (for example, probably instead of "secure human existence", the author meant "secure non-human existence") so that a literal translation of this fragment would be meaningless. Thus, it has been decided to make a free translation based on the ideas expressed in the rest of point 3. *N. from t.*

¹² *Idem. N. from t.*

¹³ "Designated wilderness areas". *N. from t.*

¹⁴ "Northern Rockies Ecosystem Protection Act" in the original. *N. from t.*

the valleys of the Carmanah, Megin, Stein, Khutzeymateen, Boise, Kitlope, Mehatl, Skagit, Clendenning, and Niagara, as well as South Moresby. These are not marginal lands for human use; the value of its wood is millions of dollars. Just because some parks contain ski resorts, are grazed by cattle, and are logged doesn't mean the parks are useless; it means we have to fight ski resorts, cattle and logging in parks.

Furthermore, to say that the parks have failed is to accept a very narrow and uninformed view of the protection of ecosystems. Alpine and subalpine ecosystems, which possess their own unique species, which are in their own right just as important as the endemic species of primary forests, have been reasonably well protected. All other ecosystems partially protected by the parks - including small and medium-sized pieces of productive and economically valuable land - also represent partial victories. Park creation is a process in which all protected areas to date are victories while more and larger parks still need to be created to complete an ecologically viable system of protected areas.

Ultimately, if one believes that nature has intrinsic value and that humans cannot improve it, then there is really no valid option but to leave the wilderness as it is and protect it from further disturbance by humans; this is the definition of a protected area, or what is often called a "park". Some people have problems with the word *park*, since it has the connotation that wild nature¹⁵ is there for the recreation of human beings; OK, so let's call them "ecological reserves" or "wilderness reserves." But not defending the protection of a threatened ecosystem just because we don't like its name and therefore allow it to be cut down or destroyed by open-pit mining, is a crime.

5. Nature needs human management to stay healthy. For example, exotic species often need to be controlled, artificial burning must be done¹⁶ in isolated habitats, predators must sometimes be controlled to allow populations of endangered species to recover and new individuals must be introduced into small, isolated populations to avoid inbreeding. Therefore, since nature must be managed, ultimately, there is nothing wrong with managing a landscape through selective logging, controlled grazing or limited agriculture.

This argument is made by some conservation biologists and land managers who perceive that active management of some wilderness areas is necessary to maintain their natural character. Humans have so disrupted populations and natural processes that human intervention is often needed to correct past mistakes. However, the difference between correcting and managing *human-induced* failures of nature and managing nature *itself* is enormous. Parks can still be defended even if the areas in question need such remedial management; however, their status as protected areas should imply

¹⁵ "Wilderness" in the original. *N. from t.*

¹⁶ "Prescribed burns" in the original. Here this expression refers to the burning that is carried out in certain wild ecosystems adapted to fire. In principle, the purpose of these artificial burns is to try to restart the natural fire regime in these ecosystems and thereby promote their recovery in those cases in which natural fires have been artificially prevented in the past by fire suppression policies. forestry. *N. from t.*

a prohibition on managing nature itself. Unfortunately, some people lump both the management of human error and the management of nature together under the general concept of "management" and support "alternative" forms of raw material extraction instead of full protection, thinking that such activities are not fundamentally different from artificial burning or removal of alien species.

Presentation of “WHY THE PRODUCTIVE LANDSCAPE DOES NOT WORK”

The following article, like much of the others published in Wild Nature, is written by an American author and is based primarily on US data and context. However, as we have noted elsewhere (see introduction to the section of texts on Wild nature and ecocentric theory -

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocentrica>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocentrica>]), it does not prevent a large part of its content and the ideas that are raised in it from having universal validity. In fact, the debate about the Anthropocene, which has caused such a stir in recent years among American conservationists, is not something so new to European readers concerned about the state of the wild: the discourse of the defenders of the Anthropocene, focused on the human and favorable to the total domestication of Nature, it is not really different from the one that the vast majority of European environmentalism has been promoting since its inception. In Western Europe, natural spaces with little or no humanization have been, for many centuries, much scarcer and smaller than in the United States or other parts of the world. This, coupled with the absence in a large part of European countries (especially those of Latin origin) of a culture that values the wild and, with it, of a non-humanist environmentalism, has resulted in European ecologists, in the Most of the time, they defend an ecological ideal that represents a humanized and degraded Nature, subjected to human management and exploitation and in which, often, human culture and its products end up being considered even more important than the natural environment in Yes. In the United States and other countries (such as Canada, for example), this has largely not been the case, at least until recently. Thus, when the promoters of the Anthropocene appeared, there was a strong reaction from many of the abundant conservationists who always took the wild as their main reference. And, precisely because of the existing analogies between the discourse of the current defenders of the Anthropocene and that of most of European environmentalism, it is important to know these reactions, since to a great extent they also serve to question a good part of the assumptions and anthropocentric goals of the latter. This is the reason why we believe it is worth publishing this text.

Regarding the defects of the article, we have already pointed out that the fact of considering as priority goals the legal preservation of wild natural spaces and the intentional limitation of the human population will not be able to conserve wild nature in the long term, due to the constant and growing pressure that, as long as the techno-industrial society continues to exist, will inevitably continue to be exerted on Nature (see in Indomitable Nature, for example, the presentation of “Wild Nature: what and why?” -

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/naturaleza-salvaje-qu-y-por-qu>][<http://www.naturalezaindomita.com/textos/naturaleza-wild-and-ecocentric-theory/wild-nature-and-why>] with respect to the goal of legal preservation of ecosystems).

We have also criticized the idealism that affects a large part of conservationists and that negatively influences their ability to correctly identify the causes of the destruction of Nature and, therefore, to act effectively on them (see, for example, the introduction to the text section on wild nature and ecocentric theory - [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica>] or the presentation of “The wild lands of history” [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/las-tierras-salvajes-de-the-history>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/las-tierras-salvajes-of-history>][wild-and-ecocentric-theory/the-wild-lands-of-history], in Untamed Nature).

It only remains to point out the clumsy choice, in our opinion, of the expression “productive ecosystems” (“working ecosystems” in English) to refer to wild ecosystems, since it can create confusion in readers when discriminating between it and Similar expressions, and with a totally opposite meaning, used by the promoters of the Anthropocene, such as “productive landscapes” or “productive forests” (“working landscapes” and “working forests” respectively). Therefore, we ask readers to pay special attention to this detail when reading the article.

WHY PRODUCTIVE LANDSCAPE DOESN'T WORK

By George Wuerthner

Words influence the way we think about things. We use euphemisms to hide or modify the perception of what might otherwise produce negative reactions if we used more honest terminology. Saying “collateral damage ” , for example, sounds more innocuous than announcing the death of civilians; of non-combatant women, men and children. “Coercive interrogation,” to take another example of alternative language, became a convenient phrase for the Bush administration, when it had clearly stated that

"this administration does not torture people." In George Orwell's *1984*, the Ministry of Peace waged war.

George Lakoff, author of *Don't Think of an Elephant*, suggests that conservatives and industry have spent decades defining ideas and carefully choosing catchy language to best present them. One of the most insidious terms used to promote a pro-development agenda is *productive landscapes*[b] and its derivatives, such as "productive ranches"[c], "productive forests"[d], "productive lands"[e] or "productive rivers"[f] (with hydroelectric dams). The latest sequel to "productive landscape" is "productive wild ecosystem"[g], a term used to describe extensive domestic cattle ranching operations in the southwestern United States.¹ Extractive industries have successfully cornered the values debate through the frequent use of the phrase "productive landscapes", positively interpreting land that is logged, grazed, cultivated or otherwise modified by humans.

The expression "productive landscapes" was coined by the New England logging industry, seeking to give a more pleasant image to the destruction and ruin that it caused for the natural landscape and to counteract the, then popular and much more accurate, classification of cleared land. such as "Paper Mills" or "Paper Colonies". The notion of productive landscapes was adopted to deal with the negative connotations of "factories" and "colonies" in the minds of the public, with the former hinting at smokestacks and the latter evoking imperialism.

For example, the brochure "Keeping Maine's Forest"[h], published by an assemblage of logging companies and unidentified conservation and environmental groups, touts the virtues of the "productive forest" for its ability to provide timber and environmental values. The brochure says: "Maine's Forests have long been productive forests, producing lumber for ships and buildings, pulp for paper, firewood and biomass for heating and electricity. Maine's Forests support thousands of jobs for

[a] Translation of the chapter "Why the Working Landscape Isn't Working", from the book *Keeping the Wild*, edited by George Wuerthner, Eileen Crist and Tom Butler (Island Press, 2014). Translation by Último Reducto. *N. from t.*

[b] "*Working landscapes*" in the original. Literally, it would mean "worker landscapes", "work landscapes" or "labour landscapes" and refers to those landscapes that produce a benefit for human beings through their modification and management. However, trying to find an expression that would sound better in Spanish while preserving the original meaning of "landscapes put to work", in this text it has been translated as "productive landscapes" on all occasions. *N. from t.*

[c] "Working ranches" in the original. *N. from t.*

[d] "Working forests" in the original. *N. from t.*

[e] "Working lands" in the original. *N. from t.*

[f] "Working rivers" in the original. *N. from t.*

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

[g] “Working wilderness” in the original. *N. from t.*

[h] “Conserving the Maine Forest.” *N.* Maine citizens and contribute billions of dollars to the state’s economy - all while providing critical environmental services such as water quality, wildlife habitat and the setting of carbon.”²

Subsequently, the expression “productive landscape”[1263]³ has been widely adopted throughout the United States and is used to describe economic activities based on the exploitation of natural resources, including agriculture⁴, livestock extensive⁵ and logging⁶. In fact, a Google search returns 70 million results for the term *working landscape* alone, not including *working forests*, *working ranches*, working farms or other variations on the theme.

Surprisingly, the expression “productive landscapes” has been adopted by many members of the environmental movement or by people with conservation leanings – despite the fact that “productive landscapes” denotes and heralds the domestication of natural systems. In particular, proponents of the “Anthropocene” idea – the assumption that humans control the Earth today and should manage it intelligently – have embraced the phrase “productive landscape” as a centerpiece of their conservation agenda. ⁷ Even the chief scientist of The Nature Conservancy[j] says that the goal of conservation is no longer “to preserve the wild, but to tame nature more wisely.”⁸

The concept of productive landscapes is reminiscent of the puritanical American work ethic. The implicit message of productive landscapes is that these lands - controlled, modified, tamed and used for so-called human productive purposes - are somehow more valuable, more functional, than natural lands. In fact, there is often the idea that if we do not manage the land, it will degrade. For example, the Working Forest website suggests that the greatest threat to America’s forests is lack of management: “Rich countries like the United States love their forests so much that they are killing a

² Original title: *The Vanishing face of Gaia*.

³ “Self-willed” in the original. Although it would literally mean something like “of its own volition”, this expression is widely used metaphorically by Anglophone defenders of wilderness to refer to non-artificial ecosystems with their own dynamics, that is, autonomous, wild. *N. from t.*

⁴ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁵ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

⁶ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁷ A couple of examples:

⁸ For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

lot of them by not actively managing them”[k].⁹ Another comment, posted online by the Idaho Forest Products Commission under the topic title “Working Forests,” echoes that same attitude: “Harvesting is also an essential part of good management that can improve forest health. and maintain the growth of our forests.”¹⁰

It would be another matter if advocates of so-called productive landscapes merely said that the lands are still capable of providing limited conservation value if used for human purposes, but advocates of productive landscapes often defend them as desirable alternatives and/or “superior” to natural landscapes.¹¹ In a video recently aired on Iowa Public TV, for example, the narrator asks the question, “How do we maintain the ecosystems of our hillsides, coastlines, and countryside for future generations?” And then he answers: “Transforming them into productive landscapes.”

Lands exploited or used for human purposes are proposed as suitable alternatives to natural wilderness, as they are often portrayed as a win-win relationship, with people exploiting natural systems for utilitarian benefit, at the same time. time that nature, supposedly, also benefits from said exploitation.¹² This justification is similar to how southern plantation owners excused slavery by saying that slavery benefited their slaves by giving them work, housing, and food.¹³

Subtly appealing to the American Protestant ethic, the implicit underlying meaning of the expression “productive landscape” is that self-contained, natural landscapes[l]

⁹ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹⁰ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out* , page 237).

¹¹ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

that are untouched by human manipulation and control are not productive, useful, or used, and they are operating at their full “potential”. For supporters of “productive landscapes,” these self-contained wildlands[m] are not contributing to human health and happiness—or at least not to economic prosperity. In his opinion, there is no doubt that these wild lands are not producing economic gains for companies, individuals or society.

On the contrary, “productive landscapes” are linked to economic benefits. In a special issue on productive landscapes appearing in *Rangelands*, the authors defined areas designated as productive landscapes in terms of economic production: “‘Productive’[n] means, first, that there is some activity *productive* on the land - such as farming, ranching, or logging”¹⁴[italics added].

A recent report on this issue states, “Most people who talk about ‘Productive Landscape’ mean land actively used for agriculture and logging.”¹⁵ In yet another example, the Idaho Forest Products Commission noted, “Productive forests[o] keep Idaho’s economy going. The wood and paper businesses employ more than 15,000 inhabitants of the state. These are good, solid jobs that pay better than other industries. And these employees pay more than \$20 million to the state in taxes each year.” However, in the same publication the authors noted that many national forests were “unhealthy” because they had not been actively “managed” for productive uses.¹⁶

Promoting speeches that give value to “productive landscapes” delegitimizes the protection of wild lands and paints the exploitation of Nature green. In reality, human manipulation of the earth generally leads to biological impoverishment. Compared to natural ecosystems, “productive landscapes” tend to have lower total productivity and suffer losses of biological diversity, soil health, and other ecological attributes.¹⁷

¹⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁵ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “...it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁶ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*], we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

Maintaining these areas also often requires a significant amount of energy input.¹⁸ Finally, the idea of "productive landscapes", as a conceptual model of conservation, diverts values towards utility for human beings, ignoring the intrinsic value of Nature.

Productive landscapes reduce production processes and are not ecologically benign

Productive landscapes, because they manipulate species composition and production for human ends, tend to disrupt evolutionary processes. A tree plantation managed for timber extraction cannot support natural elements and processes such as insects, disease and fire, as they are threats to maximizing wood fiber production. A landscape grazed by livestock, often consuming the entire production of native plants, suffers numerous negative consequences for native vegetation and fauna. Native herbivores rely on the same plants that cows or sheep eat for food, and other animals rely on natural vegetation for shelter. Compared to the original grasslands it replaces, a prairie that is plowed and worked into a monoculture of corn or soybeans is, biologically speaking, ruined. Promoters of productive landscapes used to be tied to industrial or exploitative economic interests, but increasingly include politicians, the media, and social justice advocates (and even many land defense groups[p]) who they relate "productive landscapes" with the protection of supposed cultural traditions.

Acknowledging that human activities have altered much of the world's natural ecosystems and *celebrating* this fact, as advocates of productive landscapes often seem to do, are two different things that reflect profoundly different attitudes. Clearly we can do better in managing a forest to preserve more natural functionings or designing a farm to promote more suitable habitats for wildlife, but we should not delude ourselves into thinking that such exploitation schemes are superior alternatives to natural ecosystems.

Given our current global population and reliance on technology, humanity may have no choice but to "put the landscape to work"[q]. At the same time, however, we should be aware that many of the activities in productive landscapes are ultimately unsustainable (if only because of their heavy dependence on energy inputs from fossil fuels) and sooner or later impoverish. and reduce the natural world.

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁸ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

In fact, in most cases, “productive landscapes” are biologically impoverished compared to the natural landscapes they have replaced.¹⁹ Just to give an example, a comparison between unlogged primary[r] forests and a managed forest in 20

Ontario showed a 50 percent reduction in logged forest genetic diversity.²⁰ Biodiversity preservation involves more than just maintaining native species. It also requires above all the preservation of the ecological and evolutionary processes that produced that biodiversity. Unfortunately, more active management deliberately reduces natural ecological/evolutionary processes. For example, much forest management in the western United States is currently justified as necessary to prevent and curb the effects of native pine beetles, which kill some trees, and/or to reduce the number of forest fires, which constitute one of the main evolutionary forces in forest ecosystems.²¹ Similarly, even the best managed livestock operations tend to favor the removal of large predators such as wolves, which are important due to their trophic cascading effects on herbivores and native plant communities.²²

The mistaken assumption of proponents of productive landscapes is that managed farms, ranches, or forest lands are ecologically benign and help promote conservation. In fact, after years of hearing the propaganda in favor of production landscapes, many people now believe that protecting production landscapes preserves “open space”[1265]²³ and assumes that open space is the same as land. suitable habitats for wildlife. Few realize that because of the emphasis on subjugating natural systems to economic ends, productive landscapes may be “open” but are far from wild or natural.

Agriculture, by definition, is the conversion of native plant and animal communities into simplified farms dominated by a few selected domestic species. Except for urbanization[t] or strip mining, nothing beats agriculture in terms of total destruction of natural processes and systems. In fact, in much of the world the main cause of habitat

¹⁹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²⁰ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²¹ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

²² “Red pine” in the original. American Red Pine, *Pinus resinosa*. N. from trans.

²³ “Open space” in original. N. from t.

fragmentation and degradation is agriculture.²⁴ Society depends on agriculture to feed us, but we should also understand and recognize that agriculture is the antithesis of wilderness.

Extensive ranching and cattle grazing are somewhat less destructive than cultivation because native vegetation is maintained to some extent, but their global physical footprint affects at least 25 percent of the ice-free land surface.²⁵ Therefore, the overall effect of livestock farming on biodiversity is very important.²⁶

Domestic species, such as cattle or sheep, generally replace native herbivores. All over the world, native animals are forced to compete with domesticated ones for food. In addition, domestic animals raised on relatively arid lands often require irrigated pasture or hay crops that dry up streams and rivers, thereby damaging aquatic ecosystems and fish populations. Abstraction of water for irrigation from the Big Hole River in Montana, for example, has been the main factor that has brought the Montana arctic grayling (*Thymallus arcticus*) to the brink of extinction. Also, depending on how they are managed, domestic animals can trample stream beds and pollute the water, and the fences needed to contain them become barriers to migratory animals.²⁷ Livestock can also transmit diseases to native species. Domestic sheep, for example, are known to carry diseases that are lethal to wild bighorn rams.²⁸ Since domestic animals are unable to evade predators, governments and ranchers often kill bears, wolves, lions, cougars, tigers, and other native predators to protect domestic livestock. In addition to being ethically questionable, the elimination of these 28 predators has serious repercussions on ecosystems.[28]

While commercial logging often supports native tree species and is therefore less destructive than agriculture, it also has significant ecological effects. First, most forest operations require access roads. Both tracks and logging fragment forest landscapes and provide pathways for invasion by invasive species, produce sediment that pollutes rivers, and provide access to hunters who can adversely impact the numbers and relationships of plant and wildlife communities. animals.²⁹ Logging also changes the age structure of forests. In times before European colonization, large-scale disturbance was rare in many forest communities and thus the forests were older and many were what we would now call *ancient* or *forests. primary*[v].³⁰ These ancient forests had an increased abundance of stumps, root mounds exposed by falling trees, and large-diameter fallen

²⁴ Page 114.

²⁵ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²⁶ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁷ "Sweat lodge" in the original. *N. from trans.*

²⁸ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

²⁹ "DNR" in the original. "Department of Natural Resources". *N. from trans.*

³⁰ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

tree debris (RAC)—all of which are now viewed by ecologists as critical biological legacies. for the long-term functioning of the forest ecosystem.

The antithesis of landscapes dominated by human exploitation of resources are wilderness ecosystems, or what I call “productive ecosystems”[w]. Productive ecosystems are productive regardless of human aspirations. They are home to most of the world’s species, the sources of pure water, and the places where ecological and evolutionary processes operate with minimal human interference.

Father-knows-what-is-best syndrome

When I was a child, I used to watch a TV show called “Father Knows Best”[1267][1268][1269][1270]³¹, about the Anderson household, an idealized family of middle class. The father was a patient patriarch who dispensed wise advice to his wife and three children. There was never a crisis that Dad couldn’t solve, and in a way, the show reflected the optimistic attitudes of America during my childhood in the ’50s and ’60s.

Those who advocate further taming of the Earth in the form of “productive landscapes” have much in common with the mythical Anderson family. Proponents of productive landscapes maintain a dad-knows-what-is-best attitude that, at best, demonstrates a lack of caution regarding human manipulation and exploitation of the Earth. . In fact, the overriding philosophical assumption behind the expression “productive landscape” is that humans are intelligent and wise enough to manage and manipulate landscapes without causing significant harm to the biosphere.

There is no doubt that human beings exert a tremendous influence on the Earth’s continents, sea and atmosphere. According to some reports, more than a third of the global land area of the continents is under cultivation,[1272] and an even greater amount of land is used for livestock production.[1273] Add to these facts the clearing of forests, the overfishing of the oceans, humanity’s burning of fossil fuels, which is leading to climate change, and a growing human population that demands more and more of the Earth’s resources, and it will be easy to see why human beings can be considered a geological force that is influencing evolution. And yet, there is a critical difference between documenting and acknowledging human impact and accepting it as inevitable and even desirable.

Industry and those who seek profit by grabbing the Earth’s resources for private profit have long portrayed the exploitation of the natural world in a positive light. What is new about the case of the defenders of productive landscapes is that they promote the same exploitation and manipulation saying that it is to “save” nature. Whether these advocates are corporate representatives or new environmentalists, they lack humility and fail to recognize how little we understand about how the Earth works.

³¹ “Father Knows Best” in the original. *N. from t.*

Unlike the mythical father of the TV show, who used to get positive results, every time we think we've solved a problem or figured out a way to exploit nature more effectively, we've probably created a new unintended consequence.

Many of the spokesmen for this new environmentalism try to undermine or devalue time-tested approaches to conservation such as parks and nature reserves or protected areas[y]. For example, Emma Marris, author of *Rambunctious Garden*, has asserted that advocates of parks and wilderness[z] seek to preserve nature in its pristine, pre-human condition.[1274] Yet no serious advocate of parks believes that such places are "untouched" in the sense of not being touched or affected by humans at all. To make such a claim, one would have to deny global warming, the presence of pesticides and other chemicals all over the planet, and a host of other well-known human impacts. Those who are involved in conservation are well aware of these human influences.

There is, however, an immense variety of degrees of human influence. Downtown Los Angeles is much more of a human-made and -dominated environment than, say, Alaska's Arctic National Wildlife Refuge[aa]. In the Arctic Refuge natural forces continue to dominate the land. Preserving such places where natural forces operate with a minimum of human influence is still the best way to preserve nature and evolutionary processes.

Parks and wilderness are key to conservation

Parks and natural protected areas[bb], as well as other reserves are well-established means of conserving natural ecosystems and species. Protected areas are the cornerstone of biodiversity conservation: they favor the migration of species, offer refuges for exploitation, maintain important habitats and - perhaps most importantly - maintain ecological and evolutionary processes. Although few existing parks and reserves are adequate to protect all native species and ecological/evolutionary processes, science has shown that large reserves work to slow or minimize species losses even if they do not completely eliminate such losses. .[1275]

For example, Harini Nagendra conducted a meta-analysis of 49 protected areas in 22 countries, looking at the proportion of deforested land outside protected areas compared to land within reserves. Nagendra found that land deforestation was "substantially lower" in protected areas compared to surrounding unprotected areas.³² A meta-analysis of marine reserves reached similar conclusions, finding that marine reserves had significantly higher numbers of species, biomass, and diversity than adjoin-

³² "Wise-use movement" in the original. The "Wise Use" movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

ing unprotected areas. As expected, larger reserves showed larger absolute differences than smaller ones, confirming that large protected areas are better at conserving biodiversity.[36]

Today about 13 percent of the Earth is protected, yet species continue to head toward extinction. The fact that extinction is not completely prevented, however, does not mean that protected areas are useless in conservation efforts: on the contrary, it means that we need more and larger protected areas that are connected to each other. The best conservation science has confirmed that we need larger protected areas to act as nuclei, linked by wildlife corridors[cc].³³ Where such protected areas are located could also be of great importance. For example, a recent study found that protecting 17 percent of the Earth's surface could conserve two-thirds of all 38 plant species.[38]

A visit to any of Alaska's reserves, such as the Arctic Refuge, would confirm that restraining development and human impacts is essential to preserving species and ecological processes. Of course, the refuge is not immune to human impacts - global warming is thawing permafrost, polar bears have high levels of PCBs, and so on - but, as a whole, the Wilderness Arctic Refuge is less degraded than any of the landscapes. production of the globe. Ecological processes such as floods, droughts, forest fires, blizzards, predation, etc. they still function here virtually unimpeded by human manipulation. Even popular parks like Yellowstone - which is suffering from various intrusions, such as the introduction of an exotic trout species to Yellowstone Lake, white pine blister blight that is killing whitebark pines (*Pinus albicaulis*) and the proliferation of various species of non-native grasses - are even healthier, ecologically speaking, than the surrounding private lands and public lands managed by the Forest Service[dd] or the Department of Land Management[ee] that they are open to resource extraction and commodity production.³⁴

The problem with many reserves is that they are too small and are established in the midst of heavily altered domesticated landscape environments.[40] That's a human-made problem, and it's a problem humans can solve by enlarging protected areas and reducing the portion of Earth devoted to domesticated landscapes. Will this be easy? I sure don't. However, it is not impossible either. We should not accept the argument that we have no choice but to accept a further reduction in natural areas due to human population growth or desires for more and more goods.

Proponents of "productive landscapes", who see them as a cornerstone of human-friendly conservation, are undermining public support for large interconnected protected areas and replacing them with an alternative of dubious efficacy. By simplifying conservation, they are making it trivial. For example, Marris presents "designer ecosystems"—ecosystems that humans shape to include domestic and exotic species—

³³ "Between villages there is a death zone" in the original. *N. from t.*

³⁴ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

as harmless or “the new wild nature”[ff].³⁵ Even if we assume that man-made nature can benefit people, such landscapes can only minimally support native species.

We have already seen the consequences of this type of impact, intentional or not: for example, the highly flammable arabueyes[gg] originally introduced to the western United States to improve grazing for cattle, yet ended up changing dramatically the regimen of fires with disastrous consequences for the native flora; or the numerous introductions of

[cc] “Wildlife corridors” in the original. *N. from t.*

[dd] “Forest Service” in the original. *N. from t.*

[ee] “Bureau of Land Management” in the original. *N. from t.*

[ff] “The new wild” in the original. *N. from t.*

[gg] “Cheatgrass” in the original. It refers to the grass *Bromus tectorum*. *N. del t.* non-native species in Australia (including rabbits, red foxes, camels and feral cats), all of which have had devastating consequences for species native to that continent.

The loss of native species has serious consequences for the functioning of ecosystems. Compared to species moved to a new location, native species tend to have a much higher number of interdependent species. Douglas Tallamy, in his book *Bringing Nature Home*, offers numerous examples of how native trees, such as oaks, can have hundreds of insects associated with them, while non-natives, such as those that typically used in urban gardens and parks, they may only have half a dozen or fewer.[42]

Elimination of native insect habitats produces a chain of effects through the ecosystem by reducing food for many insectivores, including many species of birds. We are not even aware of many of these relationships, and thus advocating the alteration of plants and animals to satisfy human desires is a risky enterprise at best. Biodiversity losses and the promotion of ecosystem manipulation practices (even if well-intentioned) carry inherent ecological risks. Showing such a presumptuous attitude toward these matters demonstrates the arrogance that comes with the father-knows-what-is-best stance.

While we can admit that parks, reserves and other protected areas will not completely halt the accelerating loss of biodiversity across the globe, protected areas are a means of preserving natural ecological functioning and evolution proven by many years of experience. The protection of natural areas should be the priority goal in any strategy to protect life forms on Earth.

A looming issue, which is often grossly underestimated if even discussed, is whether an Earth domesticated by humans and populated by nine or ten billion people is possible. Many proponents of the “productive landscape” suggest that human technology and intelligence will save us from any limits to growth.³⁶ However, given the immense

³⁵ 1 mile is approximately 1.6 km. *N. from t.*

³⁶ In this regard, see also the presentation of “There where man is a visitor” by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

and growing need for energy, the need for basic resources such as clean water and adequate food, as well as the need for infrastructure to support billions of people, it is more than questionable whether such a world is even possible. , not to mention whether it is sustainable. It is, therefore, simply a matter of prudence to reduce our global population, our exploitation of resources and, finally, to stop our domestication of the Earth. It is reasonable to argue that at least half of the Earth's continental surface and the vast majority of the seas should be protected reserves in which exploitation by humans is limited or prevented. However, this is only feasible through a substantial reduction in human population and consumption. That proponents of the Anthropocene fail to even acknowledge that we need to limit population and consumption is emblematic of their denial of reality.

A key aspect of supporting protected areas is the implications of such decisions. Although rarely specifically admitted in such reserve designations, by leaving natural areas out of development, we are implicitly challenging a human-centric worldview. We are asserting that at least a portion of the globe is not a field open to resource extraction by human beings. Instead of rejoicing in unconscionable human growth, setting limits to exploitation by human beings becomes a statement of restraint and self-discipline. Parks, natural areas[hh] and other protected reserves are therefore a philosophical recognition, at least in a certain way, that we do not know everything. Since the Father may not know what is best for the Earth, and to ensure our own survival and quality of life, we recognize that we must keep significant parts of the globe where human influence is minimal.

Another practical reason for establishing parks and other reserves is that these places serve as markers and reminders of how our collective actions have changed the natural world.

[hh] "Wilderness areas" in the original. *N. from t.*

Without protected areas we can enter a kind of ecological amnesia that distorts our perspective. Without old-growth forests as a reference, for example, it is easy for people to think that tree plantations are forests. Without wild herds of bison or wildebeest, it is easy for people to believe that domestic cattle are, in some way, a functional ecological equivalent. Without native predators controlling prey populations, it is all too easy to forget how a healthy landscape works with predator presence. And of course, without large wilderness areas, it's easier for people to believe that human taming of Earth is a neutral or even positive force.

Conclusion

Regardless of what their direct benefits may be for human beings (clean water, recreation, landscape beauty, etc.), parks, natural areas[ii] and other protected ecological reserves are basically a clear moral statement that we recognize the need to safeguard natural processes, native species and indigenous landscapes due to their inherent right

to exist. Establishing protected areas is a symbolic moral gesture that the philosophical attitude of-father-knows-what-is-best is not an adequate indicator to guide the relationship of human beings with the natural world.

As I have said before, it is one thing to recognize human domination over the landscape and quite another to celebrate and promote it. The term *productive landscape* -together with the proposition of the term *Anthropocene* to call our geological epoch-expresses self-promotion regarding the human impact on the Earth. Such terms give a positive meaning to something that is actually a destructive process.

All ranching, farming, and logging are unlikely to disappear anytime soon from rural parts of the country where “productive landscapes” are idealized. Locally produced agricultural products, especially fresh vegetables and fruits, can help meet the food needs of communities. Furthermore, a reduction in export-oriented commercial agriculture and timber production, coupled with the simultaneous expansion of land area devoted to natural ecological processes and wilderness, would go a long way toward creating “productive ecosystems”. And productive ecosystems in the background provide the longest-term benefits, both for human societies and for communities of native flora and fauna.

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Presentation of "THE EARTH IS NOT A GARDEN"

The interest that we see in the following text is that it is a quite accurate critique of ecomodernist currents based on the concept of the Anthropocene.

However, the author falls into two errors to which it is necessary to draw attention here:

1. The author, following the traditional line of conservationism, speaks of cultivating the feeling of "modesty and respect" towards Nature as the main way to achieve its preservation. Certainly, the feeling of humility and respect for Nature is something praiseworthy, which obviously the editors of Wild Nature share and consider fundamental, but we doubt that by itself it is enough to effectively preserve wild Nature. The reason for this is that what determines the development of societies are not fundamentally the ideas, feelings, attitudes or values held by their members, but the material factors, the physical conditions that restrict, condition and push said societies to take the direction they follow. And, therefore, the destruction of Nature by human societies is mainly determined by the material factors that condition their development (demographics, need for resources, technological capacity, etc.). The prevailing ideas, beliefs and values in these societies are only an effect of such development, not its cause. The prevailing ideas and attitudes can and usually serve to justify and reinforce such development, but they neither originated nor maintain it by themselves. And in the same way, the ideas and feelings contrary to that destruction are not going to serve, by themselves, to change the course of society and with it the destruction of Nature. The only thing that could achieve this would be something equally physical that affects the material bases for the maintenance and development of the techno-industrial society.¹

Having seen what has been seen, it is therefore not strange that the author naively believes that it is enough to let ethics and ideals (taking the wild as a fundamental value) serve as a guide to "intensification" (that is, to the development of the techno-industrial society) promoted by neoconservationists. However, as we have pointed out, ideals and principles do not work by themselves. Values and ideas can serve to define ends and inspire and incite to pursue them, but achieving those ends requires more

¹ In this regard, see also the presentation of "There where man is a visitor" by Dave Foreman in Indomitable Nature: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

than ethics and ideology. If the material conditions that primarily determine the development of techno-industrial society are not modified, ethics and ideals will achieve nothing by themselves and development will continue on its current course, with all the destruction and subjugation of the wild that it inevitably entails.

2. Keim, also in the typical conservationist vein and related to the above, naively believes in the possibility of reaching a balance or compromise between the development of modern technology and the preservation of wild Nature. Hence, despite his criticisms, he makes certain concessions to ecomodernists and speaks positively of "conservation finance", of certain forms of genetic engineering, of collaboration between ecomodernists and multinationals (The Nature Conservancy and Rio Red, for example), etc. However, such a balance is impossible. The only way to effectively preserve Wild Nature in the long term would be the complete physical removal of the techno-industrial system. Any other compromise solution between modern technology and wild Nature will be insufficient to conserve the latter in the long term and sooner or later will lead to its total destruction or/and subjugation. Thus, the dichotomy proposed by Michael Shellenberger and Ted Nordhaus: either global warming or electricity, turns out to be not as fallacious as the author claims. Although this pair of eco-postmodernists cunningly tried to defend techno-industrial society with it, assuming that anyone would choose the maintenance and development of techno-industrial society, whatever its negative consequences for Nature, rather than be left without modern comforts, the fact is that in every dichotomy there are two possible options, no matter how much they are scared in this case of the other option: eliminate electricity, that is, the techno-industrial system.

THE EARTH IS NOT A GARDEN

By[<http://aeon.co/magazine/author/brandon-keim/>][**Brandon Keim**]

A few years ago, I asked a biologist friend what she thought about an idea that had recently become fashionable in environmental circles: that wilderness was an illusion and that our beloved wilderness[44] they were an outdated mental construct that did not exist in reality. She had just finished her shift on the elevated boardwalk, a volunteer-run walk through a lovely little peat bog that formed after the ice age, near what is now the largest commercial area in eastern California. Maine.

After a moment's reflection, she told me that this was probably true, in an academic sense, but that she didn't pay much attention to it. The fact was that places affected by human activity, such as peat bogs, were special and had to be protected; other places were much less affected, but they were special and also needed protection.

It was a simple and practical answer, coming from someone who had spent much of his life caring for the natural world. I've been reminded of it now that conservation ideals are under siege from the movement's own self-proclaimed vanguard: the Green Modernists (also known as New Conservationists, post-ecologists, or ecopragmatists),

a group of influential thinkers who argue that we should accept our domination of the planet and rethink the Earth as a giant garden.

Put aside your attachment to the wilderness², they say. There is no such thing, and to think otherwise is certainly counterproductive. And when it comes to wildness³, some of it might remain on the fringes of our gardens - designed and managed to serve the wishes of human beings - but it's not particularly important. What if you appreciate wild plants and wild animals for themselves? Well, forget about that too. Those sentiments are as old-fashioned as a daguerreotype of Henry David Thoreau's beard, as dead as a dodo⁴ in an epoch, the Anthropocene, characterized by literally breathtaking human domination of the Earth. .

It is true that humanity has enormous power. About a quarter of all terrestrial photosynthetic activity and half of available freshwater is diverted for human purposes. We are altering ocean currents and atmospheric patterns, and we are moving as much rock as erosion processes. The total biomass of humanity and our domesticated animals exceeds that of all other land mammals; our plastic spreads through the oceans. We are driving other creatures toward extinction at a rate not experienced in the last 65 million years, since an asteroid hit Earth and ended the age of the dinosaurs.

By the middle of this century, we could become 10,000 million human beings, all of them demanding and deserving of a quality of life that today only a few experience. It will be an extraordinary challenge and it will considerably affect the planet. Coping with it will require, as the green modernists rightly point out, new ideas and tools. It will also require a deep and abiding respect for non-human life, no less important than the respect we show for one another. Power is not the same as supremacy.

If humanity is to be more than just a biological asteroid, nature lovers, contrary to what was recommended, in a seminal essay co-authored by Peter Kareiva, chief scientist at The Nature Conservancy, the world's largest conservation organization world, we should not "cast aside idealized notions about nature, parks and wilderness⁵" or stop "pursuing the protection of biodiversity for its intrinsic value". Nor can we replace these ideals with what science writer Emma Marris envisions as "a boisterous, half-wild, global garden⁶ maintained by us."

² "Wilderness" in the original. *N. of t.*

³ "Wildness" in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply "wild nature". Here, except where otherwise noted, it has been translated as "the wild character." *N. of t.*

⁴ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

⁵ "Wilderness" in the original. *N. of t.*

⁶ "Rambunctious garden" in the original. It is an allusion to *Rambunctious Garden* which, as the author points out below, is the title of a book by Marris in which he defends the domestication and management of the Biosphere. *N. of t.*

However well-intentioned the ideas of these authors may be, they are inappropriate for the Anthropocene. We need to defend wilderness more, not less. And although defining humanity's role as that of the global gardener seems innocuous, the idea contains the seeds of the fundamental error of industrial society: an ethical vision in which only human interests matter. It is not the project of a garden, but that of a landscaped cemetery.

Green modernism is not exactly new. On the contrary, it has crystallized arguments that have seeped into conservationism over the last few decades, reaching their apogee after the publication of Marris's book *Rambunctious Garden: Saving Nature in a Post-Wild World* (2011) and Love Your Monsters: Postenvironmentalism and the Anthropocene (2011), a collection of essays produced by the Institute for Advancement⁷, a think tank⁸ based in California. When you add in Kareiva's prominence within The Nature Conservancy, the media hook of a paradigm shift, and the general frustration - shared by green modernists and their critics alike - at the inability to stop ecological destruction, it's all set for what American journalist Keith Kloor called a battle for the soul of environmentalism to take place.

In this battle, the modernists wielded strategic and tactical weapons. In their eyes, conservationists were too doomsday and obsessed with stories of defeat: polar bears on icebergs, ecosystems forever altered. Nature is resilient, they objected. The forests grow back. After all, polar bears could handle the heat. Likewise, conservationists should be more realistic and recognize the impracticality of their hopes. And they should also be more humanistic. Nature has been protected, too often, at the expense of human beings.

"Conservationists will have to come to terms with human development and the 'exploitation of nature' for human ends," wrote Kareiva and her collaborators, Michelle Marvier, a professor of environmental studies, and Robert Lalasz, the director of science communications for The Nature Conservancy. . Green modernists called on big business to join them and emphasized "ecosystem services," by which nature is measured and turned into products based on the benefits it provides us. They also blamed conservationists for being technophobes reluctant to applaud technologies that promote prosperity while reducing our ecological footprint.

⁷ "Breakthrough Institute" in the original. *N. of t.*

⁸ "Think tank" in the original. Think tanks are usually organizations made up of multidisciplinary theorists and intellectuals who express their opinions on[https://es.wikipedia.org/wiki/Pol%C3%adtica_social][social policy,][https://es.wikipedia.org/wiki/Estrategia_pol%C3%adtica][political strategy,][<https://es.wikipedia.org/wiki/Econom%C3%ada>][economic o[<https://es.wikipedia.org/wiki/Militar>][military,][<https://es.wikipedia.org/wiki/Tecnolog%C3%ada>][technology]o[<https://es.wikipedia.org/wiki/Cultura>][culture .]They are characterized by having some kind of ideological [https://es.wikipedia.org/wiki/Ideol%C3%b3gica][n] orientation and are often related to military laboratories, private companies and academic or research institutions. another type. His works usually have an important weight in politics and public opinion, particularly in the United States. *N. from t.*

In themselves, many of these ideas were not so radical. They represented an update, at the beginning of the 21st century, of the managerial approach that was previously evident everywhere, from fishing to environmental impact studies. What made green modernism so controversial was the implicit ideological shift: that human interests should be put above everything else. The justification they gave for this amounted to rewriting ecological history all over again.

According to green modernists, mainstream conservationists are obsessed with the 19th-century idea of pristine wilderness⁹ untouched by human hands. Consumed by nostalgia, they have failed to comprehend the historical significance of human ecological influence, practicing a cult of wilderness that is not only ineffective, but illusory. "Conservation cannot promise a return to pristine, pre-human landscapes," say Kareiva and her colleagues. "The wilderness so dear to conservationists – 'unencumbered' places¹⁰ – never existed, at least not for the past few millennia, and possibly even for much longer" .

Looking through sepia-tinted glasses, conservationists are presumably unaware of other, less pristine forms of nature, the landscapes and habitats associated with our activities. Recalling his childhood, spent playing in the second-growth forests¹¹ of North America's Northwest Coast, Marris writes that "such forests have long been ignored by ecologists and conservationists. Caught by the lure of 'untouched wilderness', they left behind secondary forests".

It's an odd statement, given that a Google search for "second-growth forest" returns over 54,000 results; and it is not difficult to mention several conservationists whose ecological awareness arose in such "ignored" spaces. Poet and environmentalist Gary Snyder grew up right in the very woods Marris refers to, on a "stump farm" - a term derived from the removal of the stumps left behind when giant old-growth forest trees are felled - while north of Seattle. Bob Marshall, the forester and activist whose efforts led to the Wilderness Act of 1964 and the US federal wilderness system¹², warned as early as 1930 that purity thresholds "unattainably high" would leave secondary forests unprotected. Aldo Leopold, one of the fathers of modern environmentalism, whose

⁹ "Wilderness" in the original. *N. of t.*

¹⁰ "Untrammelled by man" in the original. It refers to a famous and controversial section of the US Wilderness Act (section 2c). *N. from t.*

¹¹ Secondary growth forests, or secondary forests, are forests that have grown again after being felled and that, after a sufficiently long period, are in the process of recovering, so that the effects of felling cease to be appreciable. Secondary forests are different from forests that regrow after natural disturbance (early serial forests), such as fire, pests, wind, etc. since they largely lack the nutrients, as well as the protection against erosion or the capacity to retain water in the soil that dead trees provide. *N. from t.*

¹² "America's federally designated wilderness system" in the original. *N. of t.*

influential book, *A Sand County Almanac*¹³ (1949) is a chronicle of nature on a prairie farm of the time of the Dust Bowl¹⁴, is a particularly interesting example.

Leopold, a hunter and forester, initially believed in the managerial tradition that saw nature as a resource. The trees, the fish and the pheasants existed to be used by us, albeit responsibly. However, over time he came to consider this ideal insufficient, a transformation recounted in “Thinking Like a Mountain”¹⁵, his essay about hunting a she-wolf. “Having seen the green fire die” in the wolf’s eyes, he wrote, “I felt that neither the wolf nor the mountain agreed with this way of seeing things.”

And then there is Thoreau himself, patron saint of conservation and a favorite target of Anthropocene ideologues, who deride him for extolling the virtues of the wild¹⁶ while living a stone’s throw from the city. However, if anything, this should make it even more relevant. Thoreau, in the secondary forests and along the railway lines, discovered “another civilization different from ours” and suggested that “in the wild character is the salvation of the world.” However, green modernism does not want to recognize this, just as it does not want to take into account the definition of the “unfettered” state of nature so valued by conservationists.

“Unhindered” doesn’t mean untouched, but *unrestricted*. Wilderness[61] as formally defined by the Wilderness Act, are simply places where the processes of nature have not been seriously impeded by human activities. It is best understood as a scale of degrees of wildness, a term derived from the Old Norse¹⁷ word for “will”. Wildness consists - for Thoreau, for the ecological historian Roderick Nash and for entire generations of conservationists - in having a will of one’s own¹⁸. The wild is free and autonomous, existing independently of human control. This is what so many conservationists are passionate about: not just the Arctic National Wildlife Refuge¹⁹ or the Amazon jungle, but also the wildlife they encounter in everyday landscapes, on their own walks through the footsteps raised timber from a peat bog. A few may obsess over the pristine, but most love the wild²⁰ and their appreciation for the wilderness²¹ is much more practical in nature.

¹³ There is a partial Spanish translation of “A Sandy County Almanac” in *An Earth Ethic*. Waterfall Books, 2005.

¹⁴ Literally “Dust Bowl”, “Dust Bowl” is the name by which the phenomenon is known in English that in the 1930s affected the plains and prairies that stretch from the Gulf of Mexico to Canada. The soil, stripped of moisture, was blown up by the wind in great clouds of dust. The drought-resistant grasses of the original prairie ecosystem were replaced by wheat crops that, failing due to drought, left the soil bare, creating dust storms of unprecedented magnitude. *N. from t.*

¹⁵ There is a Spanish translation of “Thinking like a mountain” in *An Ethics of the Earth*. Cataract Books, 2005. *N. from t.*

¹⁶ “Wildness” in the original. *N. from t.*

¹⁷ Norse. *N. from t.*

¹⁸ “Self-willed” in the original. *N. from t.*

¹⁹ “Arctic National Wildlife Refuge” in original. *N. from t.*

²⁰ “Wildness” in the original. *N. from t.*

²¹ “Wilderness” in the original. *N. from t.*

It doesn't matter, the caricature that portrays conservationism as doomsayer is only a necessary complement to the second premise of green modernism: that human activity in the 21st century is the mere continuation of what we have been doing for millennia. The supposedly pristine pre-industrial landscapes that cajoled conservationists had already been altered, making the ideal of wilderness meaningless.

"Some ecologists view the Anthropocene as a disaster by definition, seeing all human-induced changes as a degradation of virgin Eden," Kareiva, Marris, environmental scientist Erle Ellis, and ecologist Joseph Mascaro wrote in an editorial in the journal *New York Times*, in 2011. "Yet, in fact, humans have been modifying ecosystems for millennia." The founders of the Institute for Advancement, Michael Shellenberger and Ted Nordhaus, make a similar comment in *Love Your Monsters*: "The difference between the new ecological crises and the ways in which humans and even prehumans have been shaping non-human nature for tens of thousands of years is of degree and scale, not kind.

The Amazon is one of the favorite examples of massive alteration of nature. The discovery of prehistoric orchards and irrigation canals beneath the presumed primary forest caused a wave of excitement a decade ago. Those discoveries, which were reported primarily in Charles Mann's book, *1491: New Revelations of the Americas Before Columbus* (2005), and in the works of anthropologist Michael Heckenberger, seemed to rewrite ecological history. Far from being a wilderness untouched by humans, the great Amazon rainforest, the Earth's delicate lung, had been exploited until recently! "The very notion of a 'virgin rainforest' may be wrong," Kareiva wrote in 2007 in *Science* magazine.

But this opinion is very controversial. Although certain areas of the Amazon were indeed populated, they were comparatively small: patches of intense modification scattered in the middle of an immense wilderness²². Certainly, the Amazon was not domesticated on a scale even remotely similar to that of the Anthropocene. Some archaeologists have even suggested that the areas of the Amazon where earthen constructions were carried out²³ were dry places similar to the savannah, making their impacts less dramatic. The Indians practiced agriculture locally, not landscape engineering.

This is not just archaeological trifles. Blurring the line between the limited impacts caused by humans in the past and extensive human activity on the enormous scale of the Anthropocene today makes it difficult to recognize the wilderness, large and small, that still remain in many places, from the depths of the southern oceans to the boreal forests, passing through much of the Amazon. This confusionism also dilutes

²² *Idem. N. from t.*

²³ The author refers to the discovery of large geometric figures of earth (geoglyphs) in certain areas of the Amazon basin. See, for example, "Environmental impact of geometric earthwork construction in pre-Columbian Amazonia," John Francis Carson, Bronwen S. Whitney, Francis E. Mayle, José Iriarte, Heiko Prümers, J. Daniel Soto, and Jennifer Watling, in *PNAS*, July 7, 2014. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>][<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>]. *N. from t.*

the differences between ways of life. Limited and careful management of nature - fires that try to mimic regional fire regimes or agricultural systems adjusted to existing hydrological cycles - is considered on the same level as activities that ignore these ecological traits.

Not that indigenous societies were always harmonious administrators who left a light footprint. There are many examples to the contrary, the most notable being the extinctions that occurred after the arrival of stone age humans in the Americas and Australia. However, these extinctions by no means meant the disappearance of the wilderness²⁴, nor do they fall in the same place on the spectrum of degrees of impact on nature that industrial-scale development occupies. Once we outcompeted 20-foot²⁵ tall giant sloths²⁶ and saber-toothed tigers, now we have trouble sharing space even with kangaroo rats²⁷ and tiger salamanders²⁸. This is the difference between transformations brought about by a few million people and those brought about by 7 billion, with drastically different resource requirements. And this difference is concealed by the narrative of human omnipresence.

This narrative is linked, according to the professor of environmental law, David Johns, in an essay published in *Keeping the Wild: Against the Domestication of Earth* (2014), "To the idea that the significant presence humanity and the remarkable impact of our species mean that humans are in command." It is an example of modern myth-making, the normalization and self-justification of a human-dominated Anthropocene devoid of wilderness, in which those damn conservationists have to catch up with the program. As Marris states in *Rambunctious Garden*: "We are already running the whole of the Earth."

All of this might seem to some like a storm in a teacup: an internal feud. However, ideas matter, especially when they involve questions as fundamental as how we see ourselves in relation to other living things. Dismissing wild nature and underestimating wildness lead us into ethically disturbing situations. And they are in turn the result of an ethically troubling situation: ecological philosopher Eileen Crist equates green modernism with the mentality that put humans at the top of the Great Chain of Being in the Middle Ages, and kept us there. Until Charles Darwin came along.

The garden metaphor is especially fraught with implications. A garden is not a place for ethics. In it life and death happen according to the whim of the gardener. To plant or to cut, to tend or to kill, to include or to exclude: it is a morally unrestrained exercise of the will, which is fine for a backyard, but which requires limits, both literal and philosophical. "Once we've adopted a gardener's mentality, it will give us too much freedom to do whatever we want," says bioethicist Gregory Kaebnick. "And I know what I'm talking about, I'm an avid hobby gardener."

²⁴ "Wilderness" in the original. *N. of t.*

²⁵ 1 foot = 30.48 cm. *N. from t.*

²⁶ Genus *Megatherium*. *N. from t.*

²⁷ Rodents of the genus *Dipodomys*. *N. from t.*

²⁸ *Ambystoma tigrinum*. *N. from t.*

In a garden, there is not necessarily the feeling that life has any value other than what we assign to it. Neither individual beings nor larger entities - populations, communities, species, ecological processes - are intrinsically deserving of respect. The gardener's ethic cannot take that into account. What Leopold so wisely advised: that we think of ourselves not as conquerors of communities of living beings but as "mere members and citizens" of them, is thrown out the window.

Furthermore, the values we assign are inevitably biased towards what we have planted and controlled. "Civilization ... is the garden where relationships grow," wrote the poet Howard Nemerov, a revealing phrase quoted by Gary Snyder in *A Place in Space* (1988). "Outside the garden lies the wild abyss." This mentality is already deeply embedded in our development-oriented society. What is not managed is devalued, if it is not considered totally invisible. No one walks straight through a flower bed; yet we trample on so-called weeds in an empty plot without even realizing they are there. In a landscaped Anthropocene, nature runs the risk of becoming an aesthetic abstraction, largely only interesting because we can find our own reflection in it.

Therefore, the restoration of pre-industrial ecological references is considered impractical, but the so-called Pleistocene rewilding²⁹ - parks managed to contain something similar to the ecosystems of a million years ago - is applauded. Trying to prevent the extinction of species is somewhat old-fashioned, but "de-extinction"³⁰ through biotechnological reconstruction of species is the latest cry. These kinds of projects have some value, but they reflect a self-centered notion of the nature of the Anthropocene that can easily become toxic.

A notable example comes from a *post* on the National Public Radio *blog*³¹ from January of this year, titled "A Human-Driven Mass Extinction: Good or Bad? The author, Adam Frank, comments on an interview in *New Scientist* with ecologist Chris Thomas, who points out that today some lineages are adapting to human activities while those activities are pushing many others to adapt. extinction. "How does that make you feel? How should it make them feel? Frank was asking about the imminence of mass extinction." "The answer to that question depends to a large extent on what each one understands by nature and where they think we should fit into it."

This line of thought never applies to human affairs: "A city has been bombed tonight and other people are building shelters out of the rubble! Is that good or bad?" Merely asking is ridiculous. After all, human lives have intrinsic value. However, according to the logic of green modernism, non-human lives do not. In most cases, they represent preferences or services. It is the exploitative essence of colonialism applied to nature, the consecration of the very attitudes that have turned humanity into a biological asteroid. To stop protecting nature for its own sake, to judge conservation by the degree to which it promotes human interests, is to reshape our relationship with the Earth

²⁹ "Pleistocene rewilding" in the original. *N. from t.*

³⁰ "De-extinction" in the original. *N. of t.*

³¹ "National Public Radio" in the original. It refers to an American radio station. *N. of t.*

into the same shape as the relationship between an empire and resource-producing colonies. The expression "The Earth" refers only to us.

Wild nature and wild character are the opposite of this. As ideals, they embody respect for non-human lives, recognizing that they do not exist solely in relation to us. Upon entering a wilderness³², Nash writes, we realize that we are not in a playground, but in the home of others. It opens us to the perception of the intrinsic value of other lives and the importance of sharing.

"Conservation is inspired by the question: who are the members of my community?" says Kieran Suckling, executive director of the Arizona Center for Biological Diversity. "It is an act of humility. It requires you to tell yourself, 'It's not just my wants and needs that are important. What other creatures want and need is also important.'"

This does not mean that human beings cannot or should not cause any harm, much less that they should cease all their activities. It is impossible not to leave a mark. However, we can think about where we put our feet, cultivate a sense of modesty rather than haughtiness, and let courtesy and respect guide us. It is a habit of mind that is useful in relationships within our own species as well. "The lessons we learn from the wild³³," Snyder writes, "become the protocol of freedom."

Easier said than done, of course. Green modernists would counter that it's unrealistic: those lovable ideals may have won a few battles, but conservationists are losing the war. New ideas are needed. Leaving aside the dubious proposition that principles should be abandoned when they are difficult to put into practice, a few of his criticisms seem uncomfortably on point.

Clearly more is needed. If conservation victories had been enough to bear our weight, the Earth would not be headed for mass extinction. And it is true that conservationists have all too often relied on hackneyed platitudes. It is more than evident that not "everything" is "connected with everything else"; the extinction of one butterfly will not bring down the entire ecological edifice. Similarly, prejudice against non-native species can backfire; if today the non-native vegetation were eradicated, large numbers of butterflies would starve. The discourse of fragility and irreversibility ends up tiring too. Life can be fragile, but it can also be remarkably resilient.

The emphasis that green modernists place on ecologically viable development is also welcome, even if its promoters play some strident notes. ("Putting our faith in modernization will require a new secular theology," Shellenberger and Nordhaus write, and "requires a worldview that sees technology as benign and sacred.") The nascent field of conservation finance, a nature-focused extension of social benefit-oriented crash investments³⁴, has tremendous potential.

³² "Wilderness" in the original. *N. of t.*

³³ "The wild" in the original. *N. from t.*

³⁴ "Impact investing" in the original. It refers to investments, in companies or organizations, theoretically made with the intention of generating a social or environmental benefit apart from economic benefits. *N. from t.*

However, without the ideals of wilderness and wild character as guides, the compass spins aimlessly. Pursuing intensification - the green modernist goal of achieving more productive agriculture and denser cities, thus presumably leaving more space for nature - requires ethical leadership. Otherwise, what is promised is merely intensification over an increasing portion of the Earth's surface. Embracing technology is equally inaccurate advice. There is a difference between crops engineered for high productivity and drought resistance and those engineered to withstand heavy doses of various pesticides.

Making such distinctions requires critical thinking about technology and development, not Kareiva and Marvier's demand that conservationists stop "complaining about capitalism," as if capitalism were some transcendental entity rather than something subject to a constant debate. Equally unhelpful are the false dichotomies of Shellenberger and Nordhaus, who write that "living in a warmer world is less of a problem than living in one without electricity."

Green modernists make a point of celebrating urban nature, which is fine. The non-human life of cities should be appreciated on principle. Bob Marshall wanted us to "learn to treat even the smallest elements of the natural world with respect," even the squirrels and scraggly elms that grow inside cities. However, urban nature is limited as a means of preserving the richness of life. This is corroborated by the global study on birds and plants that live in cities, published earlier this year in *Proceedings of the Royal Society B*. Cities contain, respectively, 20 percent of the birds and 5 percent of the plants that we might find in the corresponding non-urban locations. Yet this grim statistic is hailed in some modernist circles as good news: cities can support life!

This overly optimistic impulse characterizes many of the examples given by green modernists as evidence of resilience: rare species of salamanders that, having lost their natural habitat, have "specialized in living in cattle drinkers"; rainforests that regrow abandoned crop fields and contain half the species that previously lived there. Chernobyl is another iconic example of the apparent resilience of the Anthropocene: even after an atomic power plant meltdown, life flourishes! But the great and terrible lesson that Chernobyl has taught us is that, for non-human life, a nuclear accident is better than having us around. The best of gardens is not a garden at all. Plants and animals on Earth continue to need wilderness³⁵, both small and large.

Of course, in the places that need some of these wildernesses³⁶ and much of the wilderness to exist, there are also human beings. It's great that The Nature Conservancy is working with mining giant Rio Tinto to reduce impacts in the Gobi desert and is offering advice on how to dam Colombian rivers to minimize ecological damage. Damage control is vitally important. However, it should not be the highest aspiration of conservation and it is by no means a strategy on which the future of the Earth should depend.

³⁵ "Wilderness" in the original. *N. of t.*

³⁶ *Idem.* *N. of t.*

Recommending, as Kareiva does, that we stop “advocating the protection of biodiversity for its own sake” - or, in less sanitized terms, of life for its own sake, and measure conservation “largely by its relevance to people”, is not It is a new and bold idea. It is a surrender. It’s also somewhat impractical: can a line ever be drawn? When to stop paving a little more prairie, or leave a river undammed - given that paving and building dams also creates new types of ecosystems, and testifies to nature’s ability to adapt? Given this, green modernism would draw lines based on ecosystem services: grasslands support pollinators, undammed rivers maintain commercially valuable fish stocks. However, can this strategy be successful on a large scale? It may become possible to achieve valuable services – clean air and water, profitable “productive landscapes”³⁷ – with a minimum of biodiversity.

As biologist John Vucetich points out, the modern world aptly demonstrates that we can achieve prosperity for human beings even in the absence of the abundance of life that existed in the past. “There are so few black-footed ferrets³⁸ on the planet that it has already been shown that we don’t need them,” he says, “we’ll get by without speedy foxes³⁹ or wolverines^{40,41}. We can enumerate entire lists of species that we could do without.”

Vucetich sees the fight over green modernism as a clash between two ways of understanding sustainability: one that exploits nature as much as we want as long as we don’t harm future exploitation, and another that exploits nature only as much as is necessary to lead a fulfilling life. . “I don’t think these two worldviews are going to lead us to the same place,” he says. “I think they would lead to completely different worlds.”

Conservation successes are not simply national parks and protected areas, but the many places where human appetites are curtailed so that other life forms can flourish: patches of forest on the edges of cities, wetlands that they have avoided becoming shopping malls. Defending them is the daily bread in conservation work and, for this, ideals are needed.

“People volunteer to participate in commissions that study mining proposals, criticize environmental impact reports, challenge the unscrupulous assumptions of large companies and rise up against certain local public officials who try to betray the inhabitants”, Snyder writes about his neighbors’ efforts to protect their second-generation hillside forests in the Sierra Nevada from irresponsible mining and logging. What motivates them to do this unattractive work is not self-interest, he writes, but “a true and selfless love for the land.” It’s hard to imagine green modernism being so inspiring or, for that matter, so effective. Despite caricatures of conservationists as die-hard

³⁷ In relation to the concept of “productive landscape” see the article “Why the productive landscape doesn’t work” by George Wuerthner, in *Untamed Nature*:

³⁸ “Black-footed ferrets” in the original. *Mustela nigripes*. *N. of the t.*

³⁹ “Swift foxes” in the original. *Vulpes velox*. *N. of t.*

⁴⁰ “Wolverines” in the original. *Gulo gulo*. *N. from t*

⁴¹ “Wolverines” in the original. *Gulo gulo*. *N. from t*

fanatics, in practice conservation is an exercise in negotiation and compromise – and no decent agreement can ever be reached by falling short in the first place.

Another example in Maine comes to mind here: the ongoing restoration of the Penobscot River, the second longest in the northeastern United States, which for most of the last 9,500 years served as a pathway for migration of huge schools of fish between the Atlantic Ocean and the 7,700 square miles⁴² of its basin. During the last two centuries its entire course, save a few miles⁴³, has been interrupted by a series of dams. Those mass migrations, which historian and biologist John Walkman says once made eastern rivers "look silver," had been reduced to a sad little trickle of fish.

Over the past decade, an alliance of conservation organizations and government agencies struck a deal with the power companies: they would buy three dams, dismantle two of them, and create a pass around the other, while another dam would remain in operation and increase its generating capacity. The deal was precisely the kind of action that green modernists advocate: a balance between business interests and ecological values, producing electricity while protecting life.

The Nature Conservancy helped make the restoration possible and rightly celebrated on their *website* page. However, they were not the only ones involved in it. The negotiations took place only because conservationists and fishermen had previously fought for decades to prevent the construction of more dams. The commercial value of the restored fisheries and recreational opportunities was part of the arguments for removing the dams and helped sell the project politically. Yet the driving force that kept so many people coming to meetings, reviewing impact studies, and organizing fundraisers was a love for what the Penobscot was once.

One woman I know, an artist and wildlife ecologist who makes woodcuts of river animals for local school students to use in art classes, describes the project as a renaissance. Sometimes he wades through the shallows, searching through the mud for ancient stone fishing weights made by the Penobscot Indians in pre-industrial times. The Penobscot Indian Nation has also supported the restoration, seeing it as an opportunity to heal the degradation of waters that were once central to their tribal life. And while they are under no illusions that the river will once again harbor its former wealth - after all, the negotiation left a dam intact - they are inspired by the idea. They are also moved by an intuitive idea of what is wrong. Because the life of the Penobscot had been cut short so blithely just wasn't right.

It is these feelings, of passion, modesty and respect for wild nature⁴⁴, which basically made the commitment possible. It was not cost-benefit analyses, nor any notion of humanity as the planetary gardener. If we had thrown away wild nature, both its reality and the ideal it represents, the dams would still be choking the river.

⁴² 1 square mile is roughly equal to 2.59 square kilometers. *N. from t.*

⁴³ 1 mile is roughly equal to 1.6 km. *N. from t.*

⁴⁴ "It's these feelings, wilderness-impassioned and modest and respectful" in the original. *N. of t.*

Presentation of "THERE WHERE MAN IS A VISITOR"

The value that we see in the following text is that it is a simple and entertaining refutation of the typical humanist and postmodern attacks against the concept of wild Nature. (There is another text by Foreman, "The myth of the humanized pre-Columbian landscape" [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-mito-del-paisaje-precolombino-humanizado>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-mito-of-the-pre-Columbian-humanized-landscape>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-mito-of-the-pre-Columbian-humanized-landscape>], in which many of the arguments presented here are developed in a more elaborate way).

As usual, however, we must point out certain problems or defects that we see in the text.

To begin with, the author makes certain winks and concessions, at least lip service, to the defense of social justice. Although this may apparently have a strategic justification (to win over to the conservationist cause those who give importance to social struggles for equality and solidarity; or, at least, not scare them away), in reality, deep down and in the long term, it is a error (social justice is a matter, at the very least, wholly independent of, if not incompatible with, the defense of wild Nature; and indeed, this is precisely the reason why humanists, postmodern or not, tend to attack or try to undermine the second). Apart from being a hoax in this case: Foreman has never really shown much interest in social justice, but rather the opposite, he has always defended not mixing conservation with leftist struggles and even declares himself a conservative and "right-wing". "

Furthermore, it is typical of Foreman to confuse Protected Wilderness with Wilderness and Wilderness itself. For him, it often seems that the only thing that is wild is that which is protected. However, the protected part of Wild Nature is just that, a part of it.

And we have already commented on other occasions that the legal protection of Nature (to which Foreman gives absolute importance) will not be sufficient or effective in the long term to save wild Nature from the harassment it suffers and will continue to suffer from society. technoindustrial. The only way to truly and definitively save the wild is to eliminate techno-industrial society.

In relation to all this, the author commits the serious intellectual blunder of saying that the wild character is merely a "human concept", implying that the only real thing are the concrete places and wild beings and that any abstract idea or notion about them have no real basis. But if the notion of savagery is merely a human invention, if it does not refer to a trait that exists in reality, how do we know that the beings and systems Foreman claims to protect are truly savage? Wildness is not a human invention, but an objective feature of certain processes, systems and physical beings (those that exist and function by themselves, that are not artificial and act autonomously, following their own dynamics). Foreman is a passionate defender of wild Nature with many years of experience behind him, and this honors him and makes him worthy of being taken as a reference on many occasions, but sometimes intellectually he leaves much to be desired. To demolish every abstraction, every idea, every notion, every concept as mere human inventions, is clumsy (aside from the fact that the abstract critique of "abstraction" is, ironically, a typical trait of many postmodernists).

Regarding the fact that legally protecting, that is, voluntarily leaving unexploited or destroying certain wild areas, is an act of humility, despite being true, it also poses a problem: it diverts attention from the ultimate causes of the destruction and subjugation of Wild Nature, which are material (population, technology, geographical expansion, etc.), towards "causes" that in the best of cases are secondary when not mere effects of said destruction and submission (values, attitudes, ideas, wills). The lack of humility before Nature was not the first cause of the domination of the wild (it is rather the effect of it; an effect that in turn reinforces domination, of course, but which was not its origin), and therefore, humility, necessary as it may be, will not be enough to save what remains of the wild on Earth.[a]

WHERE MAN IS A VISITOR

By Dave Foreman[b]

In the past, opposition to Wilderness Protected Areas[c] and National Parks used to come from those whose economic interests led them to want to exploit publicly owned natural resources, often with the financial help of the government. It's still like that. However, more recently, the opposition has also emerged from an ideological position of "People First!"[d]. Edward Abbey[e] is often quoted as saying, "The wilds[f] need no defense, only defenders"[g]. Cactus Ed[h] himself told me that he had never said that and that this sentence made no sense to him. It is clear that the wilds[i] need defenders. However, with such an ideological attack by arrogant humanists¹, the Wilderness needs to be defended not only as a place, but also as a concept.²

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

Wilderness advocates from the fields of anthropology, archaeology, history, rural sociology, philosophy, and conservation biology need to investigate the claims made by humanist opponents of

[a] In this regard, see, for example, the presentation of “The Earth is not a garden” in *Naturaleza Indómita* ([<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-land-is-not-a-garden>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-tierra-no-es-un-jardn>]).

[b] Translation by Último Reducto of “Where Man Is a Visitor”. Original text published in *Place of the Wild*, David Clarke Burks (ed.), Island Press, 1994. *N. from t.*

[c] “Wildernes Areas” in the original. In this text, this expression has been translated as “Wild Protected Areas”, except in cases where it is explicitly indicated otherwise. *N. from t.*

[d] “People First!” in the original. It refers to anthropocentric postures. The expression “People First!” shows a clear contrast with the ecocentric position implied by the expression “Earth First!” (“The Earth First!”), name of an environmental organization founded, among others, by Foreman in the 1980s. *N. from t.*

[e] Edward Paul Abbey (1927-1989). American writer whose ideas about wilderness and industrial civilization greatly influenced radical conservationism and environmentalism in the United States in the second half of the 20th century. *N. from t*

[f] “Wilderness” in the original. The term “wilderness” refers to lands with little or no humanization. In this text it will be translated as “wild lands” or “wild areas”, unless explicitly stated otherwise. *N. from t.*

[g] “Wilderness needs no defense, only defenders” in the original. *N. from t.*

[h] Nickname by which Ed Abbey was known. *N. from t.*

[i] “Wildlands” in the original. *N. t.* the Wild Areas and fight them off. And all lovers of the wild and free need to mount a strong defense of Wilderness Areas. What follows is neither an exhaustive defense nor a studied rebuttal. Because of this, it is largely unreferenced. It is a map drawn on the sand of a river bank with a piece of wood carried by the current. I hope it will lead some of us to develop deeper answers from the questions posed here.

One hundred and forty years ago, part-time canoeist and bean farmer Henry David Thoreau said, “I wish to say a word for Nature, for absolute freedom and absolute wildness.”[j] Today, I want to say a few words in favor of Integral Nature[k], in favor of Protected Wilderness Areas.

The introductory section of the Law for the Protection of Wild Areas of 1964 defines, in part, a Wild Area as an area “in which man himself is a visitor who does not remain.” In recent years, both charlatans and those sincerely concerned with the alienation of humans from nature have attacked the notion of a Wild Area as a place where humans are visitors. They use the absence of human settlement to label Wilderness Protected Areas as misanthropic and counterproductive. These attacks come from all parts of the globe and across the political spectrum.

We can exclude from this discussion that hairy-chest populism that calls itself the “intelligent use movement”[34]. This movement is largely made up of loggers, miners, ranchers, trappers, and fans of off-road motorcycles and drive-by hunting. These elements rave about Wild Areas because they “lock them out.” They seem to have evolved into a new species that has lost the ability to walk. Perhaps we could call it *Homo petroliens*. His opposition to Wilderness and other topics of conservation and environmentalism stems from a proud defense of ignorance that tries to express his anti-intellectualism and anti-elitism by wearing Stihl chainsaw caps. They are the servants of America’s supreme elite: the big business oligarchy. These rugged individualists are puppets whose strings are pulled by the executives of oil, mining, and logging companies. They are not a serious criticism of Wild Areas.

More troubling are those critics of Wilderness Protected Areas who come from more progressive and thoughtful traditions, both in the United States and abroad. Some are conservationists, biologists, and ecophiles. Others are environmentalists who I suspect have never been outdoors, except to hail a taxi. Let me try to put together some of their arguments and then comfortably answer them.

I don’t want to sound like a curmudgeon, but I’m tired of the Wild Areas bashing, so I’ll keep it short. I respect many of the people who have recently written questioning traditional notions about Wilderness Protected Areas and National Parks. I think I understand your frustration and hope that my answer will lead us to confluence rather than divergence. Since I do not wish to fall into the trap of demonizing others (a common pastime in academic philosophy - see the pages of *Environmental Ethics*[m]), as a general rule, I will avoid mentioning the names of the individuals who defend the following arguments against Wilderness Areas. In Latin America, Asia, and Africa, arguments against Wilderness are emphasized that are somewhat different from the arguments used in the United States, Canada, and Australia. However, because there are several hybrids, they all constitute the same herd.

I will summarize the arguments against the Wild Area concept as follows:

- Wilderness Protected Areas separate humans from nature as people are not allowed to live in them.
- What needs to be protected is the wild character, not the Wild Areas. The wild character is real; the Wilderness Areas are a human intellectual construction.
- Wilderness Protected Areas and their relatives, National Parks, are a legacy of Western civilization and its false dichotomies.
- Defenders of the Wild Areas are misanthropes. Not only do they seek solitude in remote places where no one lives, but they also want to exclude indigenous peoples and rural inhabitants from the territory.
- The environmental movement should not worry so much about wildlife and parks. Environmentalism is primarily concerned with human health.
- We should encourage people to repopulate the territory. National Forests[n] and other public lands should be open to settlement by people who wish to be stewards and healers of the land.

- Native Americans (and even rural Americans) enhance nature with their activities. Due to their deep knowledge of the land and their love for it, their activities increase biological diversity.

- The notion of a virgin pre-Columbian America is a myth. The natives modified the land to a great extent. The paradise that the Europeans found was not a wilderness, but a garden improved by humans.

- The belief in the intrinsic value of other species and natural processes is a hypocritical posture and an exclusive luxury of rich Westerners. The Third World is oblivious to notions such as those manifested in National Parks and Wilderness Protected Areas. People in “developing” countries need sustainable development that puts food in their stomachs and shoes on their feet, not reserves for wildlife. The idea of Wild Areas is alien to them. Wilderness Protected Areas and National Parks are a legacy of European and US imperialism.

- The role of human beings is to landscape the Earth. We need to take the helm of the planet and actively manage evolution and natural processes. The

[m] Magazine in English dedicated to dealing with the philosophical aspects of environmental problems. *N. from t.*

[n] The “National Forests” of the United States are publicly owned forest areas that enjoy a certain degree of legal protection and are managed by the federal government through the United States Forest Service (US Forest Service). *N. from t.*

Wilderness Protected Areas represent a dereliction of responsibility and a dereliction of duty. Without active management and human presence, natural landscapes will deteriorate and lose their biodiversity.

- With over five billion people and counting, we cannot afford Wilderness Protected Areas or large carnivores. The land and the ocean are to produce for the people. In a world plagued by economic imperialism and social injustice, progressives should direct their efforts to improve the destiny of humanity as a whole. We can’t waste time on lions, tigers and bears or open-air museums and hiking parks for the economic elite.

- Changes in the demographics of the United States will lead to a reduction in traditional support for Wilderness Protected Areas. Conservationists need to focus on more people-oriented environmental issues in order to attract Hispanics, Asians, and African Americans to the movement.

- Scientists tell us that the Earth is at the gates of the sixth episode of mass extinction. Therefore, Wilderness Protected Areas and National Parks have failed to protect biodiversity. Something new is needed that includes people: “ecosystem management”.

Demons! This is starting to sound like an FBI complaint accusing you of everything except not flossing every night. And that I have not exhausted all the arguments against the Wilderness Areas that the defenders of sustainable development and the humanist ecologists usually put forward.

Now, the arguments do not come out of nowhere. They come from people. These people have their reasons for showing their teeth against certain points of view. In the old days, the bad kids liked to dip the cats in turpentine so they could see them

screech and run. Some will think that my interest in pointing out the motivations of the agitation against the Wild Areas is like dipping cats in turpentine. I may be a grouch, but honestly, I'm a good guy deep down. Ask my sister. I am more interested in finding common ground than building barriers. However, motivations are important. I will consider those motivations as I try to point in the direction of possible responses to the criticisms against Wilderness.

I am afraid that the most outrageous critics of Wilderness Areas and National Parks understood in the American way, suffer from an exaggerated third world jingoism. Anything that comes from the United States is bad for these people. North America and Europe are to blame for all the world's problems.

Some individuals, coming from the United States, are expiating their white and liberal guilt. (I'm lucky. I come, at best, from a lower-middle-class redneck family of Scottish and Irish descent. I have my fair share of moral flaws, and one of these days I think I should stop and purge some of them, however Not on my list is the feeling of guilt for having been raised in opulence).

Western civilization (imperialism) and the United States of America deserve a lot of criticism. And I think the United States should be held to stricter standards than any other country or society because from the beginning we Americans have claimed to be involved in a superior social experiment.

I have personally experienced some of America's shortcomings. (When your government spends three million dollars to try to put you behind bars, even a tough-ass guy like me ends up showing some skepticism.)

However, the United States is not an entirely bad country. We are not the only cause of injustice in the world. Despite the efforts of J. Edgar Hoover and Ronald Reagan, we have a Bill of Rights and we jealously guard it. For all our failings, no other nation, past or present, can closely compare to the United States when it comes to protecting civil liberties. The Bill of Rights is considered the great gift that the United States gave to the world. And we have given the world an even greater gift: the idea of National Parks and Wilderness Protected Areas.

Furthermore, the anti-Americanism inherent in Third World critiques of Wilderness Areas and National Parks overlooks the corruption of elites in those countries. Blaming white males for all the world's ills is—dare I say it—racism. Furthermore, the main Third World critics of the Wild Areas are members of the socio-economic elite of their own countries, and have received a Western education.

None of this implies that we should ignore issues of international economic justice. Europe, Japan and the United States, in collusion with the spoliation barons of the Third World, consciously practice economic imperialism against the people throughout the world. Furthermore, it is necessary to safeguard lands for use by indigenous peoples and peasants, as well as to recognize and celebrate their knowledge and good administration of the territories. Wilderness Protected Areas and National Parks do not necessarily have to come into conflict with the needs and rights of the oppressed.

Some of the arguments against Wild Areas come from the myth of the Noble Savage. Alienated from our own "corrupt" society, we still want to believe that human beings are inherently good, so we idealize indigenous peoples as the first environmentalists. It seems that we cannot accept non-industrial societies as they are. Either we have to demonize them by presenting them as groups of savages with animal impulses incapable of behaving civilly, or else we have to exalt them as models of virtue.

Anthropology is like the Bible: it can be used to support any claim about human beings and nature if desired. For example, we can argue until our faces turn blue about the level of impact that indigenous peoples had in America. The prevailing view until recently was that Native Americans had very little impact on the landscape. The Puritans of New England claimed so, to justify that they were taking from the Indians the land "that they did not use". The pendulum has swung to the opposite extreme in recent years. Now some crackpots, along with some serious academics, claim that even small populations significantly altered pre-Columbian ecosystems—especially through burning. The "virgin America myth" is being debunked. The worshipers of the Noble Savage assure that said impact was positive. Some also raise the ecological pedestal even the Aztecs, the Incas and the Mayans.

However, many researchers see archaeological evidence of ecological collapse. Did the Hohokam and Anasazi exceed carrying capacity and cause ecosystem failure in what is now the southwestern United States? If the Plains Indians had been left alone for another hundred years, would they have ended up causing the near extinction of the bison thanks to the new mobility offered by the wild horses abandoned by the Spanish? Did the civilizations of Mesoamerica degrade their lands as badly as the civilizations of the Middle East and the Mediterranean? Was the extinction of Pleistocene megafauna caused by Stone Age hunters entering virgin territory?

And these are followed by even deeper questions. Is the deep philosophy of the Hopi the result of a new covenant with the earth that followed the ecological collapse of the Anasazi seven hundred years ago? Could the hunting ethic of the tribes of America (and elsewhere) have been a reaction to the Pleistocene slaughter?

Given that some claim that human shifting gardening and the use of non-native plants [or] increase local species diversity, dare we wonder about the quality of such increased diversity? Are the additional species just weeds? Do many of these exotic species come from Europe? Not all biodiversity is the same. Rare and sensitive native species are more important than weeds that thrive in human-disturbed areas.

In certain areas of the Americas, high population density and intensive agriculture have resulted in severely degraded ecosystems. The first wave of skilled hunters twelve thousand years ago probably caused the extinction of dozens of species of large mammals in the Americas. Unheard of for such a predator. However, I question, as do some others, that the North American forests and grasslands encountered by early European explorers and settlers were primarily the result of burning by native tribes. Certainly, in localized areas, the North American tribes had a significant impact on the vegeta-

tion due to the burning they carried out. But how extensive could such manipulation become with a population of only 4 to 83 million north of the Rio Grande?³

These questions do not imply opposing legitimate land claims held by Native Americans and other indigenous peoples. In most cases, tribes are better guardians and managers of the land than government agencies. Despite opposition from other New Mexico conservationists, I supported the transfer of the Blue Lake area of the Carson National Forest to the Tao Pueblo Indians in the 1970s. It was their land and they had done a better job of protecting their wilderness from what the Forest Service would have done. However, we must be intellectually honest when investigating the relations of human beings with the earth, and we must not condescend to the myth of the Good Savage and, therefore, elevate primitive peoples to implausible levels.

There is a huge gap between considering indigenous peoples or peasants in the Third World to be ecologists and ecologists and doing the same to rural residents of the United States. Among the American rural proletariat, I have encountered an abysmal lack of ecological knowledge or appreciation for ecosystems. I have requested as In the original it was written: "... and using native plants..." (whose translation would initially be: "... and the use of native plants. "). However, this is inconsistent with the rest of the paragraph, so it has been considered that the author (or perhaps the editor of the original version) made the mistake of not putting a "non" in front of "native" and, consequently, , has been corrected in this translation. *N. of t.* the ranchers who identify plants for me. They know winter fat[p] and a few grass species, but all the others are "weeds" or "weeds". Similarly, loggers and even forest rangers know about valuable trees as a source of timber, but shrug off the rest. Attitudes towards animals are even more worrying if possible. My neighbors in Catron County, New Mexico, scoffed at college biologists. I was told more than once that spiny lizards[q] were the offspring of Gila[r] monsters.

Regardless of the push and pull about the role of pre-industrial societies in changing the face of the earth, there is plenty of evidence that Wilderness - vast expanses uninhabited by humans - is not a concept alien to cultures. primitives. Native Hawaiians told me that before the conquest by the United States, humans were banned from some mountainous areas, on pain of death. Jim Tolisano, an ecologist who has worked for the United Nations in many countries, reports that tribes in Papua New Guinea demarcate large areas as off-limits to village building, gardening, hunting, and even visiting. "You must not go there; that mountain belongs to the spirits." Like the Papuans, the Yanomami of the Amazon engage in fierce and bloody conflicts (my mountain ancestors from eastern Kentucky were much like them). Between the different villages there are prohibited zones[36]⁴ in which if one enters their life is in danger. As a consequence, large areas are left uncultivated and unhunted and are rarely vis-

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ "Between villages there is a death zone" in the original. *N. from t.*

ited. Biodiversity thrives in them. These borderlands are the refuge of animals that are heavily hunted near the settlements.⁵

Some anthropologists think that the permanent state of war between some tribes is an adaptation to avoid exceeding carrying capacity, since this would result in ecological collapse. (These unused zones on the territorial borders are eerily similar to the areas where wolf pack territories abut each other. Deer abound in such places.) My ancestors were able to follow Dan'l Boone[t] to the "dark and bloody lands" of Kaintuck because they were uninhabited by Native Americans. The Shawnee from north of the Ohio River and the Cherokee from the Tennessee Valley hunted and fought in Kentucky. However, none of them lived there. Wasn't that a wilderness area until the Scots and Irish from Shenandoah invaded?

Geographers, anthropologists, historians and ecologists need to investigate these and other fascinating fields of study to show that Wilderness Areas - in which humans are non-resident visitors - were once widespread throughout the world. Wilderness[v] is not exclusively an idea of 20th century Americans, Canadians and Australians.

Can people from outside the former English frontier colonies appreciate the wilderness for themselves? I have met Native Americans and people in Mexico and Belize who are as supportive of Wilderness as I am and who believe in the intrinsic value of other species. A few years ago, at an international conference on wilderness mapping, I met South American biologists who were as uncompromising in their defense of Wilderness as Reed Noss[w]. Jim Tolisano talks about colleagues in Sri Lanka, in various African countries, in Costa Rica and in the Caribbean who make me look like a lazy bum.

It is racist to claim that only middle class Americans and Australians can be deep ecologists or supporters of Wilderness. How dare these pretentious and pampered gentlemen claim that those who are not Westerners are incapable of having a land ethic like Leopold's[38]? To say that the people of Latin America, Africa and Asia can live without beings and wild sunsets is another form of imperialism. It is exactly as racist as saying that African Americans and other people of color in the United States are not interested in wildlife or Wilderness Areas. Michael Fischer, former executive director of the Sierra Club, tells the story of being on a radio show with Ben Chasis, now the executive director of the NAACP[y]. Fischer wanted to emphasize the Sierra Club's new willingness to care about environmental justice issues in minority communities and suggested that the Sierra Club should focus less on Wilderness protection issues. Chasis chided him for his condescension. "We are also interested in wildlife and wild lands." Wilderness conservationists need to be concerned about pollution issues in

⁵ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

communities of color. We also need to help those living in inner cities experience the wilderness first hand. But we don't need to soften our resolve to protect Wilderness.

Many have a sincere and legitimate belief that we need to create a new sustainable bioregional[z] society in which people live in touch with the land. Care and restoration at the watershed level is the real task. Gary Snyder tells a beautiful story of what happened to him as he was walking down the driveway back home at sunset. He surprised a cougar who was sitting outside by the window listening to his stepdaughter play the piano. We need communities like San Juan Ridge in the foothills of California's Sierra Nevada. Arne Naess calls them "intermediate communities"[aa]. However, extensive Wilderness Areas, where humans are only visitors, are also essential, large carnivores and many other species need refuge away from constant human presence. Humans aren't always good neighbors, and the Gary Snyders are rare cases.

In fact, Wilderness Protected Areas and National Parks have not been able to safeguard the full range of native species and all ecosystem functions in North America. However, what has really failed? The idea of Protected Wilderness Areas and National Parks or, rather, the application of land management in our politicized social environment? Due to the superior political influence of extractive industries, conservationists have been defeated time and time again as they attempted to establish protected areas. The most biologically productive areas of our federal lands have been opened up to slashers, dam and highway construction, mining, and motorized entertainment.

I have spent many, many days and nights in Wilderness Protected Areas, from Alaska to Central America. I have never felt that these places where I was only a visitor separated me from nature. When I hike or canoe in a Wilderness Area, I feel at home. The Wild Areas are reality; the wild character[bb] is a human concept.

Aldo Leopold wrote that there are those who can live without beings or wild sunsets, and there are those who cannot. Many of those who criticize Wilderness Protected Areas display a lack of visceral passion for wildlife. Do they listen to the music of the geese or do they get excited at the first anemone[cc]? Do they long to know that there are wolves hunting moose in a place that is untouched by human interference? I see no evidence of such sentiments in the writings of some of the Wilderness critics.

A few of them suffer from what I would politely call the Little Red Riding Hood Complex. They are afraid of the dark. They are terrified of the big bad wolf. Pocket-sized nature reserves for rare plants are fine. For them, preserving biodiversity is just about that. However, large, wild and uninhabited places make them tremble with fear.

We can see history as the progressive control of the Earth by the Master and Lord Man[dd]. Those New Age technocrats who prattle about taking charge of evolution and *improving* the Earth are thus the monstrous heirs of Greek hubris[ee]. His adorable human garden is hell for other species. Four billion years of life become a mere overture, before Man, in all his Wagnerian glory, bursts singing onto the scene. Does our madness know limits? Is it that we do not have humility?

Enough of counterarguments. Wilderness Protected Areas, more than anything else, challenge us to be better people.

For six thousand years, each of the successive historical epochs has puffed out its chest more than the one before. As an Ozymandias[ff] fell onto the lonely, flat sands, an older and prouder Ozymandias took his place. Virtue has been increasingly replaced by dominance and the desire for power. Wilderness Protected Areas are the quiet acknowledgment that we are not gods.

Wilderness Protected Areas, where humans are visitors who do not stay, test us in a way that nothing else can. No other place teaches us humility so well - whether we visit them or not. The Wilderness Areas make us wonder: Are we capable of self-imposing the restriction of leaving some places alone? Can we consciously choose to share the earth with those species that do not tolerate us well? Can we develop enough generosity of spirit, enough bigness of heart not to be everywhere?

No other challenge requires greater restraint, generosity, and humility than the preservation of Wilderness Areas. Our friend from Concord, Thoreau, said: "In the Wild[gg] is the preservation of the World." True, very true. However, a deeper truth is that in the Wilderness Protected Areas is the Preservation of the Wild[hh].

Grades:

1. I use the term "humanistic" in the sense of one who glorifies Lord and Master Man and is openly anthropocentric on conservation issues. See *The Arrogance of Humanism* by David Ehrenfeld (New York: Oxford University Press; 1978).

2. In those places in the text where I refer to the concept of wilderness or protected places on the ground, I write Wilderness Areas ("Wilderness" in the original) and Wilderness Protected Areas ("Wilderness Areas"), respectively, with capital initials. Much of what follows is equally applicable to National Parks.

3. Based on the latest and best estimates from serious demographers.

4. George Schaller reports that when the tribes were armed only with blowguns and bows, monkeys could be found half a mile[ii] from the villages. Today, after the arrival of the shotguns, monkeys cannot be found within five miles of the settlements. Jim Tolisano reports similar changes in Papua New Guinea. [40]⁶

⁶ 1 mile is approximately 1.6 km. *N. from t.*

Presentation of "Wild nature and human settlement"

We present below the translation of the text "Wilderness and Human Habitation". The author tries to refute in it some usual criticisms about the idea of the wild. It does so from a perspective of respect and devotion to wild Nature, showing that on many occasions what happens to critics is not only that they do not share this value, but also that they directly do not understand (or do not want to understand) what is wild.

On the other hand, we have also found several ideological flaws in the text. The most important that we see in this article is the voluntarist idea that by promoting a change in the values of human beings (for example, promoting respect for Nature) techno-industrial society can be reformed, turning it into something compatible with the wild. In fact, as we have said before, not even a change in current human demographic trends (toward population decline) would by itself be a good thing for the wild, unless that demographic change is accompanied by a decline in population. at the technological level, something that is not mentioned at all in the text, nor is it usually taken into account by those who criticize human population growth. All this is very worrying, because it focuses the attention of those who love wild Nature on goals that do not really help preserve the wild in the long term.

It is also questionable that hunter-gatherer cultures were as integrated into their environment as the author claims. Although the damage that hunter-gatherers and other primitive cultures could cause to the environment is insignificant compared to the effects that today's techno-industrial society has on the biosphere, this does not mean that such damage never existed, only that it was of a magnitude much smaller than the current one.

In addition, it is also questionable that certain types of management, such as the restoration of ecosystems, no matter how careful they are, do not really hide the same evil that they are intended to combat. Is the ecosystem that emerges after a case of "restoration" really something similar to what it was originally (with the same functions and ecological processes) or a botch product of the typical human belief that something good can be done for the environment? nature intervening in it? Often the engineering arrogance and ignorance of ecosystem managers and recuperators (something largely unavoidable in complex and dynamic systems and processes, such as ecological ones, which are largely unpredictable and it is impossible to know all their details) leads them to interventions that further aggravate the problems instead

of solving them. For example, introducing new exotic species in order to control other invasive species and ultimately end up harming native species and ecosystems rather than non-native species. See, for example:[<https://www.lavanguardia.com/natural/20160311/40362282588/conejo-australia-plaga.html>][<https://www.lavanguardia.com/natural/20160311/40362282588/conejo->][<https://www.lavanguardia.com/natural/20160311/40362282588/conejo-australia-plaga.html>][[australia-plaga.html.](#)]

In any case, sometimes restoration is better than nothing, although the result is never exactly the same as what it was (it is impossible for it to become so; this is why the destruction of species, ecosystems and wild processes is so serious, since it is actually largely irreversible and unrecoverable). Sometimes, the degradation is so great, that without some help the ecosystem cannot recover by itself (or it would take a very long time: thousands or millions of years; which comes to the same thing, because by then the conditions have been able to change so much so that there will never again be an ecosystem with a similar structure and functioning in that area).

In any case, these are only technical, concrete and short-term “solutions” that, in reality and all too often, divert attention and energies away from the fundamental problem: the intrinsic incompatibility between the maintenance and development of the techno-industrial system and the preservation of Wild Nature on Earth in the long term and on a large scale. If the techno-industrial society goes ahead, efforts to preserve and restore individual ecosystems and wild species will be futile in the long run, as their destruction, degradation and subjugation will continue as the techno-industrial system needs space, energy and matter to grow. (or just to stay). In the long term and in general, the only thing that can serve to save the wild is the disappearance of the techno-industrial system.

Wild Nature and human settlement[a]

By David Johns

Wild nature[b] has been the object of new attacks of various kinds in recent years.¹ These attacks come from within the environmental movement itself and are a reaction to a number of alleged weaknesses in pro-wilderness thinking: pitting wilderness against human beings, failing to recognize the need to integrate people into nature and failing to realize that people have always modified nature. I want to respond to this set of criticisms.

Criticism number one: *the idea of wild nature[c] exists only from the perspective of the paradigm of civilization. The notion of wild nature[d] reinforces this paradigm, instead of overcoming it.*

The idea of the wild arises from the essential dualism that characterizes civilization and from the emotional and thought processes that are part of it. Civilization posits

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

itself as separate from wilderness - that is, land not under human control and hostile to it.² However, wilderness is not merely a category within a paradigm or mental construct. There is an enormous quantitative difference between the lands that are exploited by civilization (and its precursor, hierarchical and usually sedentary societies) and the lands that are not. "Wild nature" is the expression that ecocentric or biocentric people use to designate land that has not been significantly degraded by human beings.

[a] Translation by Último Reducto of the text "Wilderness and Human Habitation", which appeared in the book *Place of the Wild*, David Clark Burks (ed.), Island Press, 1994. *no. from t.*

[b] "Wilderness" in the original. The English term "wilderness" refers to ecosystems or areas with little or no humanization and can be translated in various ways depending on the context. In the present text "wilderness", unless explicitly indicated otherwise, has been translated as "wild nature" or "the wild". *N. from t.*

[c] "Wilderness" in the original. *N. from t.*

[d] *Idem. N. of human t.*, the land that still maintains ecological processes and native biodiversity.

Failing to think in terms of the wilderness/civilization dichotomy does not solve the problem of civilized societies, which colonize and consume ecosystems in much the same way that a malignant tumor consumes the cells and tissues around it.³ Human history and prehistory are full of examples of people who reduced or destroyed what they claimed to respect. To transcend the dualism between civilization and wilderness, we need to change behavior as well as thought and feeling. As we work to materially transcend dualism, we must protect what remains of the wild and restore what is needed to ensure the integrity of ecological processes.

The English term *wilderness* derives from earlier Celtic words meaning "land with a will of its own." [4,e] Land with a will of its own is neither tamed nor domesticated. It is land free from human colonization. (Colonization is not the mere presence of humans but the conversion of ecosystems to the predominant use of a single species with a consequent decline in diversity, complexity, and evolutionary dynamism.) Colonization invariably involves large numbers of people and high levels of consumption. To protect wildlands[f] is to protect their autonomous character[g] - to protect them from the supreme will of a single species. Protecting wild areas[h] is protecting biodiversity and the dominance of ecological processes. To fail to protect wilderness[i] in the name of transcending dualism is to leave areas that are relatively intact and healthy vulnerable to destruction.

Criticism number two: *people belong to nature, not something apart from it. The problem with the idea of wilderness is that it keeps people, including indigenous peoples, cut off from nature.*

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

The separation of people from nature is in fact the problem. Reintegrating people into nature is indeed the solution. Reaching people's hearts, helping them to recover their deep ties with the planet that sustains them, and rekindling their love and respect for the rest of their lives, is essential. It is no accident that the rites of passage into manhood in many pre-civilized societies involved going solo into the wilderness. There one found their deepest self as part of the living landscape. Without wild nature, we risk losing the places that make such encounters possible. If Paul Shepard is right, by losing the wilderness[j] we risk losing any opportunity to overcome our developmental stunting.⁴ By losing the wild, we lose the world that gave birth to us.

[e] Here the author has made a misinterpretation of Vest's work cited in note 4. What Vest says in that article is that the concept of "self-willed land" was shared by ancient Indo-Europeans in general, among them by the Germans and the Celts. But one thing is the concept and another the terms with which it is expressed. As Vest himself points out in his article, the linguistic roots of the term "wilderness" are Germanic (Gothic). The Celts expressed the idea of "wild land" with other terms, such as "nemeton" (where, for example, the Spanish term "nemoroso" comes from). *N. from t.*

[f] "To protect landscapes as wilderness" in the original. *N. from t.*

[g] "Self-willed character" in the original. It would literally mean "self-willed character". It has been preferred to translate it by "autonomous character" which is the same but sounds more natural in Spanish. *N. from t.*

[h] "To protect areas as wilderness" in the original. *N. from t.*

[i] "Wilderness" in the original. *N. from t.*

[j] *Idem. N. from t.*

Rekindling those feelings is just the beginning - the starting point of a long road in which human beings will have to change the way they live and reduce their numbers. How are you going to get people back into a deeper relationship with non-human nature? Many point out that people who live simply have important lessons to teach those of us trapped in the world's dominant cultures. In fact, many of those who criticize the idea of wild nature[k] point to the role that human groups play in increasing biodiversity. We will come back to this point later, but first let's see what we can learn from those who live close to the earth.

Whether we assume that groups of people who are closely associated with the earth know what we don't, or simply assume that they don't have the capacity to be so destructive, is irrelevant here. When the way of life of certain societies, such as the Kung (Southern Africa), the Inuit (northern Canada) or the Kayapo (Amazon), is described as part of ecological processes, there are two things that stand out and are anathema. for civilized societies. The first feature is a combination of a very sparse population and non-intrusive technology, neither of which should be equated with

⁴ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

cultural simplicity. The second characteristic is a largely egalitarian society devoid of grandiose plans of conquest, hoarding, or other forms of domination.

When the number of human beings increases far beyond the size of a gang and forms concentrations, the relationship with nature changes as people have to switch to more manipulative and intrusive technologies and forms of social organization. More of the ecosystem must be altered to satisfy human consumption and less remains for other species. Controlling nature to support a greater number of human beings leads, in turn, to reduced feelings of affinity with nature.⁵

How are 5.5 billion people going to get closer to the earth? How are 400 million Americans going to get closer to the earth? The 400 million Americans living today could decide to lessen their collective impact by drastically reducing their levels of consumption, but today's human population would still need to convert huge chunks of land to farms and gardens. Our numbers, and the social organization that maintains them, compel us to wage war with the wild. Our number makes us poor. We react with intolerance towards other creatures that use the space or the food that we want. We have to own everything.

For most of humanity's existence on this planet we were few, slowly expanding across the land, with the limited technology and social organization needed to support hunter-gatherer bands. The last ten thousand years, and especially the last three hundred, have witnessed a radically altered situation. We are no longer a few million. We no longer live from harvesting supplemented by fishing, hunting and scavenging, but thanks to agriculture in all its possible forms.

For most of human history we did not live in large concentrations or as sedentary populations. Until recently, many areas were unoccupied by humans, or were occupied only seasonally or temporarily, and many

[k] *Idem. N. of the t.* other areas were used only in a limited way - for sacred reasons, as areas of separation between groups and the like.⁶ Human beings in gang society are no different from other mammals in affecting the evolution of ecosystems. As human density approaches that which necessitates the practice of horticulture or agriculture (or something equivalent, such as exploiting salmon runs off the Northwest Coast of the United States), the impact of our species will significantly beyond coevolution. Although there are some examples of humans (such as beavers) acting as key species that increase diversity, normally and historically the predominant results are ecological disturbance and degradation - regardless of the idea of nature that the people involved have. In fact, people's notion of nature tends to conform to their adaptive behavior,

⁵ A couple of examples:

⁶ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

alienating as it may be.⁷ Even before agriculture and horticulture the adoption of large game hunting by some groups may have caused extinctions.⁸

Agriculture allowed a rapid expansion of the human population and the accumulation of surpluses that made possible the changes in social organization, technology, and attitudes that are normally called civilized. The rise of civilization (cities, states, great hierarchies, professional armies) marks the adolescence of the human capacity to colonize nature: to completely bury ecosystems under cities and fields, to reach out to other ecosystems for materials, to replace the diversity with monocultures and to consume entire rivers for irrigation.

Large populations of people and the social/technological processes that go hand in hand with civilization undermine ecological processes and destroy biodiversity. This is as true for the Aztec, Inca, Chinese, Hindu, and Sumerian civilizations as it is for the European. Large populations of people and certain types of technology degrade landscapes. They destroy biodiversity. A friendlier attitude towards the earth and towards other forms of life may lessen the impacts - compared to the mentality of a society that reduces nature to mere resources - but it will not prevent them. The existence of competing centers of civilization greatly aggravates the negative impact, as each center sees the other centers as threats to its hegemony and intensifies its attempts at domination and extraction.

The argument that people have been roaming around and having a significant impact on non-human nature for a long time demonstrates a strange inability to tell the difference between 50 million and 5 billion human beings and between 4 billion years (the approximate time that life has existed on earth) and the time that the genus *Homo* has existed. To claim that human beings, having acquired their ability to affect biodiversity, have improved it as a whole, reeks of the same tremendous humanist arrogance that is the hallmark of the cult of the noble savage or Renaissance man.

⁷ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁸ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

Biodiversity and ecological processes need to be protected from those billions of human beings: protected areas where no people reside, except in small numbers and with pre-Mesolithic technologies. It is simply not possible for 5 billion people to live on earth without severely impoverishing the biosphere, even if they live at the level of the poor in the Third World. It is impossible for 1 billion people to live as Americans, Europeans or Japanese do without severely degrading the biosphere, not to mention the degradation caused to their fellow humans. It would be a disaster to put such a large number of people in contact with nature so that they could undergo conversion by allowing the construction of roads and the entry of large numbers of hikers or other artifacts of civilization into the few areas that remain in which biological processes still retain some integrity. Not restoring areas -for these or other reasons- would also be a disaster.⁹

Criticism number three: *indigenous peoples had a profound impact on nature - in fact, they managed nature. Such stewardship¹⁰ of nature is essential for human beings and important for the health of nature.*

This largely depends on what one understands by *indigenous peoples* and what management or guardianship consists of. In America, indigenous peoples are the pre-Columbian peoples and their descendants. For some purposes it may be useful to think of all such people as belonging to one category, but as far as the human relation to non-human nature is concerned, doing so obscures rather than clarifies. Pre-Columbian America was home to a wide range of cultures, from the Inuit to the Aztecs to the many bands of the Amazon. Both the attitudes and the behavior of the different groups with respect to the land were very varied. The Aztecs overpopulated and destroyed much of the biodiversity and carrying capacity of the Valley of Mexico and the surrounding area. The swidden farmers were not disruptive in small numbers, but in larger numbers they altered forests, changing microclimates and causing extinctions. In some cases, burning brought erosion and long-term changes. Some farmers cleared vast forests over decades, reducing biodiversity and undermining the ecological foundation of their society.[795] Anthropologists and paleontologists debate whether large

⁹ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹⁰ “Stewardship” in the original. The term “stewardship” is often used, especially in certain Anglophone environmental contexts, to imply a type of “benign” and paternalistic management or domination of Nature; something like proposing to human beings as the “guardians” and “caretakers” who should take care of it, to protect and care for it (if not to try to “improve” it). In this

animal extinctions were caused by changes in climate or by intensive hunting of large prey. Most believe that hunting large game played at least some role.¹¹

Surely other groups of North American Indians lived integrated in nature, as one more species. However, there is no monolithic Indigenous People that can serve as a model. There are many indigenous groups, including those that have adapted significantly to the modern world and have much to teach us to those whose roots are even deeper buried than their own.

If the term *indigenous* is not uniformly indicative of ecologically sound behavior, neither are the terms *management* or *custody*. All species modify their environment. Large mammals have a significant impact on other species, both directly and indirectly through their impact on habitats. As species evolve and expand (or contract) their ranges, ecosystems change. Harold J. Morowitz has suggested that the real units of evolution on earth are ecosystems: the plant and animal community and the hydrological, trophic, and nutrient cycles. Stephen Jay Gould defends a hierarchical idea: genes, individuals, populations, species and communities can all be subject to natural selection. Lynn K. Margulis and others have long argued that the earth is best understood as a living entity with parts that co-evolve.¹² Although evolution (or co-evolution) does not have a purpose or goal, it does seem to have a direction. In a universe that tends to entropy, some of its parts that receive energy from stable sources and are able to contribute it correspondingly to a sink at a stable rate, tend to increase in complexity.[796] This has been the general pattern on earth, despite five episodes of mass extinctions.

So what is the problem when it comes to human behavior? Aren't we just co-evolving, similar to other large mammals, altering the whole thing? Sometimes we do it like this; but we usually go beyond that. Our capacity for culture gives us the ability to break, at least temporarily, the solar economy - reducing the complexity, diversity and integration of cycles and systems. Colonization, understood as the opposite of co-evolution, represents a cultural *option* that involves reshaping, even destroying, ecosystems to serve human purposes.[797] This remodeling has certain characteristics: human beings benefit to the detriment of other species and ecological processes in general; forests are turned into forest plantations or pastures, grasslands into endless soybean fields, and rivers into poisonous soups, ruining the earth's ability to recycle everything from nutrients to heat. Colonization reduces the capacity of landscapes and ecosystems to maintain diversity, replacing many species with a few or even just one. Colonization means that the human population grows, sometimes rapidly, and consumption increases - all at the expense of other species. In short, the self-regulation of the community as a whole is replaced by control over part of the whole, and spontaneity, liveliness, and ecological integrity are diminished. The tiger is caged and the ox is raised to pull the plow in the rice fields.

¹¹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹² Examples:

How do we distinguish this colonizing behavior from management or custody? The lines are not always clear, and often the contentious nature of the debate simply adds to the lack of clarity. I submit that the terms are so broad that they can be used to cover both colonizing and non-colonizing behaviour. A forest is a living, self-regulating system. Human beings, though newcomers, can, in limited numbers and with pre-Neolithic forms of social organization and technology, live as part of such a system. Anthropogenic change can mimic non-anthropogenic forces or simply be one element among many.[798] Is this management or should another term be applied to it? If it is indeed management, can the same term be used to describe the use (or suppression) of fire[m] or the execution of other pre-industrial practices that people carried out that were ecologically harmful? Detractors of the idea of wilderness[n] have objected that since pre-European North Americans managed their ecosystems and things were going great until 1492, we can do the same. However, not only were things not uniformly stupendous until 1492, but there is often a deliberate intent to try to apply the term *management* to everything from the use of bows and arrows to the use of a bulldozer. The Forest Service[o], Department of Land Management[p] and logging companies claim to be stewards and good stewards[q] of the land. Are we talking about gross misrepresentation or mere scale differences? Did some peoples have less impact because their technology was simpler or was it that their relationship with nature was fundamentally different? Or is it that some were simply better managers than others? Is it just a matter of different ends, or is the notion of management itself fatally flawed? Doesn't it really imply domination of one kind or another?

It is clear that *management* is a very broad term. The problem is really the nature of human activity in relation to non-human nature and whether such activity constitutes a type of colonization or whether it involves living in nature[r] and even restoring it. What types of human intervention that are non-colonizing and ecocentric could be called management? The purposes of human activity must be taken into account when evaluating whether management is appropriate. Ecocentric human goals include restoring the conditions for self-regulation and spontaneity of ecosystems. By removing degrading influences (industry, roads, pollution, exotic species, logging, dams, and so on) we can allow the ecosystem to begin to heal, to reestablish successional patterns and resilience against natural disturbance regimes. Whether we call it management or not, restoring an ecosystem to self-regulation is very different from trying to dominate it.

The goals of resource management, by contrast, are to maximize the extraction of materials from an ecosystem—replacing natural relationships and processes with human-imposed ones. Such an effort implies continuous inputs of energy to overcome undesirable processes and species and maintain exotic or preferred species, often monocultures. This type of management is all about control. It is in direct opposition to self-regulation and spontaneity. Ultimately, the difference between the two forms of management is the difference between power and love. The act of loving - allowing the loved one, the earth and other living things to develop in their own way - is not an act

of self-denial but a recognition that the conditions for one's own development are the antithesis of power and can only occur in the context of an integrated whole.

Guardianship usually has a connotation of benevolent management, but this term can also be used to hide a multitude of sins. Paul Shepard observes that many civilizational mythologies acknowledge and honor the evolution, or in mythological terms, the *unfolding*, of a greater whole. Human beings have a place in the whole, but not as lords of creation. Only in civilized mythologies - which are in fact reified and dying mythologies - do human beings appear as lords, administrators and managers.

Ecocentrism implies the recognition that we can only try to imitate nature and must be careful and respectful in our interactions, even when trying to help nature heal. Ecocentrics recognize that protected wilderness[799] areas are important as they have been around for four billion years and do not need to be reinvented. As Reed Noss has put it, "Wilderness[t] offers a healthy, intact , and relatively unmodified land standard."¹³ For the wilderness[u] to do this, they need to be protected from industrial civilization. Noss points out that areas that are protected from people are the only places where large, healthy populations of large carnivores and other animals can exist. Your health is an indication of the health of the system. Another definition of wild land[801] is the place of wild beasts[w]; when the wild beasts diminish or disappear, the land becomes poorer.

Ecocentric protection of wild nature does not mean that we should walk without shadows or footprints. What it means is living within certain limits: in terms of population, technology and human consumption levels. The idea of wild nature signifies a recognition that evolution is wiser than any single species, even us, and that we should therefore live humbly. It means abandoning our fantasies of control and coming to terms with reality within the community of the biosphere. It means facing the fear of nature, both internal and external, which is the reason for control.

The idea of wilderness is about learning how to live in the current - which may mean swimming upstream at times - without resorting to the dams that kill rivers. The idea of wilderness is about living with wolves and bears and sharing the planet with them on equal terms.

The defense of wild nature is not antihuman but a defense of the protection of the place that has been our home for a long time. The idea of wild nature has to do with preserving and restoring the land "with its own will" and stopping colonization. Wild nature must be protected from humans because all civilized societies, along with many of their predecessors, disrupt ecological processes and reduce biodiversity. Wild nature

¹³ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*["*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

is necessary to counteract the lethal effects of the large human population and certain forms of social organization and technology. Until human societies can be radically modified, large chunks of the earth will have to be protected from human intervention.

If I have offered more questions than answers, it is because I have more questions than answers. Our job now is to clearly state the questions. Although these arguments may sound like I think we should go back rather than forward, there is no going back in any simple sense. However, if we look at the psychological healing of the human being, we can find a useful analogy. Healing a deep psychological wound means going back to it, re-experiencing it from an enlightening perspective, and then moving on on a different path. We need to heal the wound. By hurting the earth we have hurt ourselves. As long as we are caught up in the kind of violence that arises from deep wounds, we must restrain ourselves. This is the purpose of the protection and restoration of wild areas¹⁴. It is a stopgap measure until we learn to base our lives more on love than fear.

Grades:

1. By “wilderness”[y] I do not mean legally protected wilderness areas or areas with similar status. I agree with the statement of purposes of The Wildlands Project[z]: “we understand by wild lands[aa] the extensive areas of native vegetation in various stages of their succession, which do not suffer from human exploitation; viable populations of all indigenous plant and animal species, including large predators, that are self-reproducing and genetically diverse; and the vast landscapes without roads, dams, motor vehicles, power lines, aerial flyovers, or other artifacts of civilization, in which evolutionary and ecological processes can take their course. Such wild lands are absolutely essential for the comprehensive maintenance of biodiversity. They are not a solution to all ecological problems, but without them the planet will sink into even greater biological poverty.”

2. Some civilizations are ambiguous about wild nature. Although they are generally hostile to her, they recognize that she is a source of revitalization. See, for example, Paul Shepard, *Nature and Madness* (San Francisco: Sierra Club Books, 1982) and Peter Duerr, *Dreamtime* (London: Blackwell, 1985). In any case, the civilization/wilderness dualism (as opposed to the distinction between areas used for living, hunting, sacred rituals, and separation from other groups) is central to the cosmology and composition of civilizations.

3. For the sake of simplicity I say “civilization”, however, I also mean precivilized societies that are precursors to civilization, such as chiefdoms. See, for example, Elman Service, *Primitive Social Organization* (New York: Random House, 1962) and *Origins of the State* (Philadelphia: ISHI, 1978)[bb], Ronald Cohen, *Origins of the State and Civilization* (New York: Norton, 1975), Robert McCormick Adams, *Evolution of Urban Society* (Chicago: Aldine, 1966), Hans J Nissen, *The Early History of the Ancient Near*

¹⁴ *Idem. N. from t.*

East (Chicago: University of Chicago Press, 1989) and William Sanders and Barbara Price, *Mesoamerica* (New York: Random House, 1968).

4. Jay Hansford C. Vest, "Will of the Land," *Environmental Review* (Winter 1985): 321-329.

5. See Shepard, *Nature and Madness* and Morris Berman, *Coming to Our Senses* (New York: Simon & Schuster, 1989).

6. Mark Nathan Cohen, *The Food Crisis in Prehistory* (New Haven: Yale University Press, 1977).[cc]

7. On the evolution of our gender and its expansion throughout the world, see Richard Klein, *The Human Career* (Chicago: University of Chicago Press, 1989); for an interesting interpretation see Jared Diamond, *The Third Chimpanzee* (New York: HarperCollins, 1992)dd, especially part 4. See also Marvin Harris and Eric B. Ross, *Death, Sex, and Fertility* (New York: Columbia University Press, 1987)[ee]. Regarding North America, it is interesting William M. Denevan, *The Native Population of the Americas in 1942*, 2nd ed. (Madison: University of Wisconsin Press, 1992). See also John R. McNeill, "Agriculture, Forests, and Ecological History," *Environmental Review* (Summer 1986): 122-133 and Roy Ellen, *Environment, Subsistence and System* (Cambridge: Cambridge University Press, 1982).

8. See Morris Freilich, *The Meaning of Culture* (Lexington, Mass.: Xerox College Publishing, 1971) and Marvin Harris, *Cultural Materialism* (New York: Random House, 1979)[ff]. See also Marshall Shalins, *Culture and Practical Reason* (Chicago: University of Chicago Press, 1976).

9. Paul S. Martin, "Prehistoric Overkill: The Global Model" and Richard G. Klein, "Mammalian Extinctions and Stone Age People," both in Paul S. Martin and Richard G. Klein, *Quaternary Extinctions* (Tucson: University of Arizona Press, 1984).

10. Even if wilderness[gg] is influenced by human change elsewhere on earth, that is preferable to no wilderness at all; see Reed Noss, *Conservation Biology* 1 (March 1991): 120. The degradation of wilderness by distant man-made changes is not a strong argument against the existence of wilderness, but rather an argument for more and greater wilderness (should be the frame of reference[hh]) and for limiting certain human activities wherever they occur.

11. See, for example, William T. Sanders and Robert S. Santley, *The Basin of Mexico* (New York: Academic Press, 1979), Roy Ellen, *Environment, Subsistence and System* and Andrew Goudie, *The Human Impact on the Natural Environment*, 3rd ed. (Cambridge: MIT Press, 1990).

12. See Martin and Klein, *Quaternary Extinctions*.

13. Harold J. Morowitz, *Energy Flow in Biology* (New York: Academic Press, 1968); Stephen J. Gould, "Darwinism and the Expansion of Evolutionary Theory," *Science* 216 (April 1982): 380-387; Lynn K. Margulis, *Symbiosis in Cell Evolution* (San Francisco: Freeman, 1981); Lynn K. Margulis and Dorion Sagan, *Origins of Sex* (New Haven:

Yale University Press, 1986)[804]; and Lynn K. Margulis, Mitchell Rambler, and Rene Fester, eds., *Global Ecology* (Boston: Academic Press, 1989).

14. See Morowitz, *Energy Flow*.

15. By “choice” I mean that human culture can take various forms; I do not mean to imply here that an awareness of alternatives or premeditation is involved.

16. See Holmes Rolston III, “The Wilderness Idea Reaffirmed”, *Environmental Professional* 13 (1991): 370-377 and Reed Noss, “On Characterizing Presettlement Vegetation: How and Why”, *Natural Areas Journal* 1 (1985): 12-13.

17. Reed Noss, *Conservation Biology* 1 (March 1991): 120.

THE CONSERVATION DILEMMA

By David Ehrenfeld

*Look at the lilies of the field, how they grow; they neither toil nor spin:
And yet I tell you, not even Solomon in all his glory dressed like one of them.*

Matthew 6:28-29

Man is accustomed to valuing things to the extent that they are useful to him and, given that he is disposed by temperament and by the situation to consider himself the supreme creation of Nature, why should he not believe that he also represents the ultimate purpose of it? ... Why should he not grant his vanity this little fallacy? ... Why shouldn't he call a plant a weed when from his point of view it really shouldn't exist? He will much prefer to attribute the existence of the thistles that hinder his work in the field to the curse of an enraged benevolent spirit, or to the rancor of a sinister one, than simply to regard them as children of universal Nature, as dear to her as wheat, that he carefully cultivates and that he values so highly. In fact, the most moderate individuals, philosophically resigned to their own judgment, cannot get beyond the idea that everything must at least redound to the benefit of mankind or, indeed, that some further property of humanity may yet be discovered. this or that natural organism that makes it useful to humans, both in the form of medicine and otherwise.

Johann Wolfgang von Goethe,

"An Attempt to Evolve a General Comparative Theory"

The cult of reason[b] and the modern version of the doctrine of final causes[c] interact in humanist environments[d] to reinforce each other; one of the results is that those parts of the natural world for which there is no known utility to us are considered worthless unless some previously unsuspected utility is discovered for them. Nature, in the words of Clarence Glacken, is seen as "a giant tool room"; and this is an apt metaphor since it implies that anything that is not a tool or raw material is probably worthless scrap. This attitude, almost universal in our time, creates a terrible dilemma for the conservationist or for anyone who believes, like Goethe, about Nature that "each of its creations has its own being, each represents a particular concept and , without

[a] Translation by Último Reducto of chapter 5 of the book *The Arrogance of Humanism* (Oxford University Press, 1981). *N. from t.*

[b] By "reason" the author means only logic. According to him, for thought to be adequate, it must combine reason (logic) with emotion (a term that for the author includes everything from intuition to basic impulses such as, for example, fear). With

“cult of reason” he refers to the exaltation of logical thought to the detriment of “emotion”. He tries to explain all this extensively, with more or less success and clarity, in chapter 4 of *The Arrogance of Humanism*.

[c] According to the author, the doctrine of final causes “affirms, in a nutshell, that the features of the natural world - mountains, deserts, rivers, plant and animal species, climate - have all been arranged by God to serve God. certain purposes; primarily for the benefit of mankind. These beneficial ends can often be perceived if we look carefully: rivers provide food fish and transportation routes, deserts serve as borders and boundaries, and so on. Our responsibility is to acknowledge this gift and agree to control the planet in return, an acceptance that was encouraged by some Jews and Christians even in ancient times. Therefore, the ideas of using a Nature created for us, of control and of human superiority were associated early in our history. It only remained to diminish the role of God and we would arrive at complete humanism” (*The Arrogance of Humanism*, pp. 7-8).

[d] The author uses in this text (and throughout the book to which it belongs) the term “humanism” with a very specific meaning: the idea that the human being can and should rationally control any process or complex system, among others. them Nature, as well as the idea, derived from the previous one, that the problems due to artificial disturbances caused in complex systems and processes can and should be solved by interfering in them even more. It does not refer to the more conventional and general notion of the term “humanism” that associates it with the defense and exaltation of the human. *N. of t.* however, together they are one”. The difficulty is that the humanist world accepts the conservation of Nature only piecemeal and at a price: there must be some *logical and practical* reason to save each and every part of the natural world that we wish to preserve. . And the dilemma arises on the more and more frequent occasions when we find a part of Nature that is threatened but we do not find a rational reason to conserve it.

Conservation is often identified with the preservation of natural resources. This was certainly the meaning of conservation carried out by Gifford Pinchot, founder of the United States National Forest System, who was the first to popularize the word “conservation”. Resources can be very narrowly defined as stocks of goods that have appreciable monetary value to people, either directly or indirectly. From the time that Pinchot first used the term “conservation”, its meaning has been seriously modified by overuse. An ever-increasing percentage of “conservationists” have been concerned with preserving aspects of nature - animal and plant species, communities of species, and entire ecological systems - that are *not* conventional resources, although they may not admit.

An example of such non-resources is an endangered amphibian species, the Houston toad, *Bufo houstonensis*. This small and inconspicuous animal has no value, neither demonstrated nor hypothetical, as a resource for man; other species of toad will replace it when it disappears, and it is not expected that its disappearance will make a great impression on the environment of the city of Houston or its suburbs. However, someone

thought enough of the Houston toad to grant it a page on the International Union for Conservation of Nature's lists of endangered animals and plants, and its safety has been put forward as one of the reasons. to prevent oil drilling in a Houston park.

The Houston toad has not caught the attention of all conservationists, otherwise they might already have discovered in it some hitherto unsuspected inherent value; and this is precisely the problem. Species and communities that lack economic value or demonstrated potential value as natural resources are not easily protected in societies that have a highly exploitative relationship with Nature. Many natural communities, probably most species of flora and fauna, and certain domesticated types of crop plants fall into the non-resource category, at the extreme end of the utility spectrum. Those of us who are in favor of their preservation are often motivated by a deeply conservative sentiment of mistrust of irreversible change and by a socially atypical attitude of respect for the components and structure of the natural world. These non-rational attitudes are not acceptable as a basis for conservation in Western societies, except in those few cases where the costs of preservation are minimal and there are no competing uses for the space now occupied by non-resources. Consequently, advocates of non-resources have generally tried to ensure the protection of their "useless" species or environments by requalifying: a "value" is discovered and the non-resource becomes a resource.

Perhaps the first to recognize this process was Aldo Leopold, who wrote in "The Land Ethic":

One of the basic weaknesses of a conservation system based entirely on economic motives is that most members of the land community have no economic value... When one of these non-economic categories is threatened and we happen to love it , we invent subterfuges to give it economic importance.

Economic values for non-resources

The values attributed to non-resources are diverse and sometimes quite artificial; hence the difficulty of trying to condense them into a list. In my attempt to do so, I have relied, in part, on the thoughtful analyzes offered by GA Lieberman, JW Humke, and others in *The Nature*

Conservancy[e] of the United States. All of the values listed below can be assigned a monetary value and thus become comparable to ordinary goods and services - although in some cases it would take a good deal of ingenuity to do so. They are all anthropocentric values.

1. *Recreational and aesthetic values.* This is one of the most popular types of value assigned to non-resources, because while it is often quite legitimate, it is also easily misrepresented. Consequently, it is an important part of cost-benefit analyzes and environmental impact studies, biasedly added to the accounts depending on the desired result. The category includes activities that involve little interaction between people and environments: panoramic views can be presented as a monetary value. Other less remote interactions are hiking, camping, sport hunting, and the like. Organizations like the Sierra Club[f] emphasize many of them, in part because their members place a high value on them. It is no accident, for example, that among Australian mammals,

those that are large, conspicuous, beautiful and diurnal, such as the great kangaroos that can be seen on safari, are jealously protected by conservationists and that many of them are fairly good. However, small, inconspicuous, nocturnal marsupials, such as the long-nosed bandicoot[g] or the narrow-footed marsupial mouse[h], sadly present a large number of seriously threatened or recently exterminated species.

Scarcity itself confers a kind of aesthetic-economic value, as any stamp or coin collector will be able to confirm. One of the great difficulties in conserving small, isolated populations of the beautiful Muhlenberg swamp turtle[476] in the eastern United States is that as they have become increasingly rare, the price paid for them on the black market by hobbyist tortoise breeders has risen to several hundred dollars. Some have even been stolen from zoos. Endangered hawks face a similar but more serious threat from falconers who use hawk stealers to rob them from nests on an international scale.

Some of the most vigorous attempts to give this recreational and aesthetic category a strong resource character have been made by those who claim that the opportunity to enjoy Nature, at least occasionally, is a prerequisite for good mental and physical health. Various groups of chronic mental patients have allegedly benefited more from camping trips than from other treatments, and the color green and environments lacking the monotony of man-made spaces have been claimed to have desirable psychological effects.

2. *Undiscovered or untapped values.* In 1975 it was reported that the oil from the jojoba legume, *Simmondsia chinensis*, is very similar, in terms of its physical properties, to the treated sperm whale oil. Overnight, this desert shrub in the southwestern United States went from the status of a minor resource to a very important resource. It can be safely assumed that many other hitherto little-known plant and animal species will have great value as real resources if their potential is discovered or exploited. Plants are probably the most numerous members of this category: in addition to their potential as future food sources, they may also provide structural materials, fibers, and chemicals for industry and medicine. A book entitled *Drugs and Foods from Little-Known Plants*[j] lists over 5,000 species that are used locally, but not more widely, as food, medicine, fish poison, soap, scent, protectant against termites, tanning, dye, etc. Most of these plants have never been systematically investigated. It is a basic assumption of economic botany that new domesticable crops and, more importantly, undiscovered varieties and precursors of current crops still exist in the wild or in isolated agricultural areas and expeditions are often sent to discover them.

Animals have potential resource uses comparable to those of plants, but their potential is being exploited at an even slower rate. The potential for large-scale domestication and breeding of the South American vicuña, the source of one of the world's finest animal textile fibers, was only recognized after its commercial extinction in the wild became imminent. Reports of strange uses of animals abound: chimpanzees and baboons have been used as unskilled laborers in various occupations, and even tapirs have allegedly been trained as beasts of burden. (In *High Jungles and Low*, Archie Carr

tells the wonderful - even if apocryphal - story of a Central American who decided to use his pet tapir to bring his sugar crop to market and, along the way, He discovered to his horror that instead of swimming, tapirs prefer to cross rivers by walking on the bottom). The full potential as resources, for example, of insects as a source of useful chemical by-products or new substances, has been little explored; Shellac obtained from the shellac bug, *Laccifer lacca*, is one of the few classic examples of this type of exploitation.

Some species are potential resources indirectly, by virtue of their ecological associations. One such case has been described by botanist Arthur Galston, which concerns the water fern known as *Azolla pinnata*, which has long been cultivated in paddy fields along with rice plants by farmers in certain villages. from North Vietnam. This inedible and seemingly useless plant contains colonies of blue-green algae in special receptacles on its leaves. The algae are “nitrogen fixers”, that is, they convert atmospheric nitrogen, the main component of air, into nitrogenous fertilizer that plants can use and this fertilizer dissolves in the surrounding water, nourishing both ferns and rice. Not surprisingly, villages that knew the closely guarded secrets of bracken cultivation often produced exceptional quantities of rice.

Of course, protection cannot be claimed for species whose potential as resources is unknown but probably most if not all communities contain species with such potential. Thus, the untapped resource argument has been used to defend the growing movement to save “representative” self-regulating ecosystems throughout the world (an “ecosystem” is a natural community of plants and animals in their complete physical environment constituted by the topography , rocky substrate, climate, geographic latitude, etc.). Such ecosystems range from the rocky and comparatively arid hills of the Galilee, where the wild ancestors of wheat, oats and barley still find refuge, to the tropical forests of the world, whose resources as a source of wood, food and other Forest products remain largely unknown even as they are destroyed.

3. *Ecosystem stabilization values.* This point is at the center of a difficult controversy that has arisen about the ecological theory of conservation, a controversy based on a semi-popular scientific idea that has been well expressed by Barry Commoner:

The amount of stress an ecosystem can absorb before collapsing is also a result of its various interconnections and their relative response rates. The more complex the ecosystem, the better it can successfully resist stress ... Just as a web, in which each node is connected to others by several threads, its fabric can resist collapse better than a simple circle of threads without ramifications -which if it is cut at any point, undoes in its entirety. Environmental pollution is often a sign that ecological links have been severed and that the ecosystem has been artificially simplified.

I will explain a little later why the idea that natural ecosystems that have preserved their original diversity are more stable than those that have been disturbed and simplified is controversial; but I mention it here because it has become one of the main reasons to preserve non-resources, to keep Nature’s diversity complete. A more general

and much less controversial formulation of this “diversity-stability” idea is discussed separately in item 9 of this list.

A concrete and less problematic derivation of the diversity-stability hypothesis concerns monocultures - plantations of a single species - in agriculture and forestry. It has long been known that the intensive monocultures that characterize modern forest farms and plantations make cultivation and harvesting easier and lower cost while increasing production; however, this is achieved at a trade-off for increased risk of epidemic diseases and increased vulnerability to attacks by insects and other pests. The reason for this is partly the reduction in species diversity. This results in a higher spatial density of similar crop species which in turn facilitates the spread of both pests and disease-causing organisms. Likewise, it eliminates the plant species that give shelter to the natural enemies of pests specialized in attacking crop plants. Monocultures also create problems in livestock and aquaculture, often due to the expensive inefficiency that occurs when the single species involved makes incomplete use of available feed resources. I will return to this point shortly, when I discuss game farming in Africa.

4. *Values as examples of survival.* Flora and fauna communities, and to a lesser extent species taken alone, may have value as examples or models of long-term survival. JW Humke has observed that “Most natural systems have been functioning in essentially the same way as at present for many thousands of years. On the other hand, heavily modified and human-dominated systems have not worked very reliably in the past and, in significant respects, do not in the present either. The economic value here is indirect, consisting of problems avoided (money saved) thanks to a good initial design of human-dominated systems or to the repair of defective ones based on characteristics inspired by those of natural systems. This point of view is becoming increasingly popular as disenchantment with the results of traditional planning grows. It has occurred to some to look at successful natural communities in order to look for clues about the organization of traits that lead to persistence or survival. HE Wright Jr. has most powerfully expressed this value of non-resources in the conclusion of an interesting article on landscape development: “Man’s survival may depend on what we can learn from the study of natural ecosystems.” extensive”.

5. *Environmental reference and monitoring values.* The fluctuation in the size of populations of animals or plants, the state of their organs or their by-products, or the mere presence or absence of a certain species or A group of species in a particular environment can be used to define normal or “baseline” environmental conditions and to determine the degree to which communities have been affected by non-ordinary external influences, such as pollution or habitat alteration by of human beings. Biological functions, such as the diversity of species in a particular place, when studied over several years, are the best possible indicators of the significant effects of pollution, in the same way that the behavior of an animal is the best indicator of the health of their nervous and musculoskeletal systems. Species diversity is the result of all the forces that affect ecosystems. It allows an automatic analysis of the final products. It should also be noted that the traditional economic value of a species is unimportant

in determining its usefulness as an environmental indicator - an important point if we are interested in transforming non-resources into resources.

With the exception of biological monitoring of water pollution, there are few examples of the use of to date 'worthless' species as indicators of environmental change. In the case of water pollution, pioneering work in the field of indicator species has been carried out by limnologist Ruth Patrick, who studies aquatic communities of fresh-water algae and invertebrates. She and her many collaborators have compiled lists of the types and abundance of organisms that would be expected to appear in different waters with different states of alteration.

There are a few other examples of this use of plants and animals. Lichens, complex and harmless plants that cover trees and rocks, are sensitive indicators of air pollution, especially that caused by dust and sulfur dioxide. Few lichens grow within a fifty mile radius of a modern urban area - the forests of early colonial America were described as white because of the lichen covering the tree trunks, but this is no longer the case. Common lilac develops a disease called necrotic leaf curl in response to elevated levels of ozone and sulfur dioxide. The honey from the bees reveals the existence of heavy metal contamination in the area where the bees collect the nectar. And the presence of twisted or twisted tails in tadpoles can be indicative of pesticides, acid rain, or even local climate change. All of this is reminiscent of the ancient practice of examining birds' flight and feeding to predict the future, even though we have no way of comparing the effectiveness of the results.

6. *Scientific research values.* Many otherwise economically insignificant creatures display some unique or special characteristic that makes them extremely valuable to scientific researchers. Because of their similarity to humans, orangutans, chimpanzees, monkeys, and even lower primates fall into this category. Squids and the little-known molluscs called sea hares have nervous systems with properties that make them immensely valuable to neuroscientists. The identical quadruplet litters of armadillos and the hormonal responses of the clawed frog, *Xenopus*, make them special objects of study for embryologists and endocrinologists, respectively. The strange life cycle of slime molds has aroused biologists' interest in these fungi, and they use them to study the chemistry of cell-to-cell interactions.

7. *Didactic values.* The didactic value of an intact ecosystem can be calculated indirectly by looking at the economic value of alternative uses that are not carried out on that land. For example, university administration authorities may preserve a teaching forest on campus if the competing use is extra parking for maintenance machinery, but they may not be as willing to preserve the forest if the land on which it This is where it was required to build a new administrative center. This establishes the didactic "value" of the forest for administrators.

On one occasion, in 1971, a US federal district judge ordered the New York State National Guard to remove a land fill from the Hudson River bank and restore the marsh that had previously occupied that location. One of the reasons he gave, though

perhaps not the most important to him, was that the marsh was previously used by the local high school for its biology classes.

8. *Habitat reconstruction values.* Natural systems are too complex for their functional elements and relationships to be fully described or recorded. Nor can we genetically reconstitute species once they have been exterminated. Consequently, if we want to restore or rebuild an ecosystem in what was once its habitat,

[k] *Syringa vulgaris.* *N. of t.* we need a living and unharmed ecosystem of the same type both to serve as a suitable model and to act as a source of living components. This is assumed tactically by tropical rainforest ecologists, for example, who know that when very large areas of tropical rainforest are cleared completely it is likely to end up being very difficult for the rainforest ever to regain anything like its richness of natural resources. original species and structure. In certain northern temperate forests, strip-logging, in which strips of forest are left intact to produce seeds and serve as habitat for wildlife interspersed between logged areas, is now becoming more common in logging operations. commercial. Actual cases of completely rebuilt ecosystems are still rare and will continue to be: the best example is provided by the various attempts to restore salt marshes in devastated estuaries - this has been possible because such salt marshes are relatively simple communities with only a few dominant plants. ; and because there are still many marshes that serve as sources of flora and fauna and as models for reconstruction. In the future, if certain threatened ecosystems are recognized as useful to us, any remaining fragments of those ecosystems will acquire special value as a resource.

9. *Conservative value: avoidance of irreversible changes.* This is a restatement of a basic fear that underlies every other point on this list; Sooner or later it shows up in every discussion about saving non-resources. It expresses the conservative belief that irreversible human-caused change in the natural order - the loss of a species or a natural community - may carry a hidden and unpredictable risk of serious harm to human beings and their civilizations. Preserve the full range of natural diversity as we do not know what aspects of that diversity our long-term survival depends on. This was one of Aldo Leopold's basic ideas:

A conservation system based solely on self-interest is totally unbalanced. It tends to ignore, and thus ultimately eliminate, many elements of the earth community that have no commercial value but are (as far as we know) essential to the healthy functioning of the earth.

What Leopold has done is reject an overtly humanist approach in favor of a subtly humanist one, and this failure to escape humanist bias marks a weakness in his otherwise wise and powerful argument. Leopold leaves us with no real justification for preserving those animals, plants, and habitats that, as he well knew, are almost certainly not essential to the "healthy functioning" of any large ecosystem. This is not a trivial category; it includes, in part, very many species and even communities that have always been extremely rare or have always been geographically confined to a small area. It could be countered that, for example, lichens, once ubiquitous, might in

the long run play some arcane but vital role in the ecology of forests - this would be almost impossible to prove or disprove. But the same could not seriously be said of Furbish's lousegrass, a small member of the snapdragon[m,n] family that has probably never been more than a rare constituent of Maine forests.

Exaggerations and distortions

The above list contains most, if not all, of the reasons that a humanistic society has devised to justify the partial conservation of things in Nature that, in principle, do not seem to have value for us. As such, they are all rationalizations - often true rationalizations, to be sure, but rationalizations nonetheless. And being what they are,

[l] *Pedicularis furbishiae*. *N. from t.*

[m] "Snapdragon" in the original. Plants belonging to the genus *Antirrhinum*. Its family is *Plantaginaceae*. *N. from t.*

[n] Actually, the genus *Pedicularis* is currently included in the family *Orobanchaceae*. *N. t.* rationalizations are usually easily spotted by almost everyone and tend not to be very convincing, regardless of their veracity. In this case, to most people they are not nearly as compelling as the short-term economic arguments used to justify the preservation of "real" resources such as oil and timber.

In a capitalist society, any individual or private company that treated non-resources as if they were resources would probably go bankrupt and at about the same time receive their first medal for outstanding public service. In a socialist society, the result would be that dues would not be paid, which, from a personal point of view, would be as unpleasant as bankruptcy. People are unwilling to call something a resource because long-term considerations or statistical probabilities say it might be. For similar reasons, most Western populations are content to live near nuclear power plants and continue to breathe asbestos fibers. Humanists don't like to worry about dangers that lie just beyond sight, especially when material "comfort" is at stake.

If we look at the last item on the list, the "conservative value" of non-resources, the difficulty becomes immediately apparent. The economic value in this case is remote and nebulous; it is protection from ghostly night noises, the unknown dangers of irreversible change. Not only is the risk vague, but if a hazard materializes as a result of losing a non-resource it might be impossible to prove or even detect the connection between the two. Even in cases where the loss of a non-resource seems likely to initiate undesirable long-term changes, the argument may be too complex and technical to be widely persuasive; it might even go against popular belief.

An example that illustrates this last point excellently if unintentionally has been offered by the ecologist David Owen and, independently, by the public health scientist WE Ormerod. Both have argued that the tsetse fly that transmits the cattle disease trypanosomiasis may be essential to keeping large areas of sub-Saharan Africa healthy by keeping cattle out of areas susceptible to overgrazing and thus preventing consequent desertification. However, programs for the eradication of the tsetse fly continue.

Given the great complexity of environmental relationships and the myriad interconnections between objects and events in Nature, it is also possible for ecologists to go to

the opposite extreme and postulate future consequences from present events when in fact it is not likely that they will. there is a connection or causal relationship. There are even those who, going far beyond Leopold's ecologically reasonable, albeit humanistic, position, assume that *everything* in Nature is essential for the survival of the natural world since evolution ensures that everything is there. for an important purpose or reason. R. Allen, for example, summarizes in a famous scientific publication his reasons for relying strictly on arguments in defense of resources to preserve the wealth of Nature: the economic climate is such today, he points out, that only the most rigorously practical arguments will prevail. Faint ecologists who fear that their favorite species *turn out* to be completely useless will have to take the risk. There is certainly some redundancy in the system, but there are strong theoretical grounds for believing that most species on this planet are here for a better reason than poor galactic map readers.

Allen is saying that everything in Nature - including almost all species - is highly interconnected and that almost everything has its own role to play in maintaining the natural order: consequently, almost all species are important, have value as resources. Remove even a seemingly trivial species as a resource, and it's more than likely that somehow, somewhere, someday we'll feel the consequences. This is not a new idea - its scientific popularity dates back at least to the writings of Charles Babbage and George P. Marsh in the 19th century. In the ninth chapter of his *Ninth Bridgewater Treatise*, Babbage states that "the earth, the air, and the ocean are the eternal witnesses of the acts we do... No movement, whether impressed by natural causes or by human activity, it is never erased. Twenty-seven years later, Marsh filled 550 pages with examples of the ecological consequences of our interference with Nature, paraphrasing and amplifying Babbage's ideas:

There exists, not only in human consciousness or in the omniscience of the Creator, but in external material nature, an indelible, imperishable and even possibly readable record for created intelligence, of each act performed, of each word pronounced, even more, of every desire and purpose and thought conceived by mortal man, from the birth of our first ancestor to the final extinction of our race; so that the physical traces of our most secret sins will last until they are founded in that eternity of which only religion, not science, claims to have knowledge.

Of course, in a sense, this is correct. There may be permanent traces of every act we perform (although, admittedly, in most cases they don't contain enough residual information for us to read them). And, in ecology, there are countless hidden connections, most of them impossible to know: for example, it has recently been discovered that on the island of Mauritius, in the Indian Ocean, the last old survivors of a species of tree called *Calvaria major* no longer produce suckers because their seeds, which these ancient trees still produce in abundance, have to pass through a dodo's gizzard in order to germinate. And the dodo, one of our first victims, became extinct in 1681.

But Marsh is implying more than this kind of thing. He is suggesting, as is Allen, that a considerable percentage of the traces that remain behind our actions will have humanistic consequences—it will affect resources. I cannot accept this. I agree with Marsh that the deforestation of the Ganges valley must have permanently and significantly altered the ecology of the Bay of Bengal. However, has there been any permanent and significant effect on resources from the extinction, in the wild, of John Bartram's great discovery, the beautiful tree *Franklinia alatomahala*, which had all but disappeared from the face of the earth when Bartram laid eyes on him? Or by the extinction of the countless species of small beetles, many of which we never even knew existed? Can we even be sure that the forests of the eastern United States suffer from the loss of their passenger pigeons and chestnuts in a tangible way that affects their vitality or permanence, their value to us?

The best we can say is that any loss *could* have dire consequences, and I've already shown where this argument falls short, important as it is to me and many other ecologists and conservationists. I'm not so sure that Allen's powerful theoretical underpinnings can protect the Houston toad, cloud forests, and the vast multitude of other living things that deserve a chance to evolve unhindered by the realization of our humanistic fantasies.

Thus, the dilemma of conservation is exposed: humanists are not normally going to be interested in saving any non-resource, any fragment of Nature that is not manifestly useful to humanity, and the various reasons given to show that these are not -resources are actually useful or potentially valuable are unlikely to be convincing even if they are true and correct. When everything is called a resource, the word loses all its meaning - at least in a humanistic value system.

One consequence of the dilemma is that conservationists are tempted to exaggerate and distort the humanistic "values" of non-resources. The most vexing and embarrassing example for conservationists is the diversity-stability issue mentioned

[or] "Passenger pigeons" in the original. *Ectopictes migratorius*. Very abundant species in North America until the middle of the 19th century, when it became extinct within a few decades. *N. from t.*

[p] The author refers to the American chestnut, *Castanea dentata*, which, although not completely extinct, did go from being very abundant and dominant in the forests in many areas, to being very scarce in the adult stage, due to a fungal disease, chestnut rust (*Criphonectria parasitica*), introduced from Asia by humans. *N. t.* above. However, I must make it clear from the beginning that the controversy among ecologists is not about the need to preserve the biological richness of Nature -there is little disagreement on this point- but about the specific theoretical reason, put forward by Commoner and others, that diverse ecosystems are more stable than impoverished ones (as far as the short term is concerned), that they are better able to resist pollution and other undesirable changes induced by man. As ecologist David Goodman said:

From a practical point of view, the diversity-stability hypothesis is not really necessary; Even if the hypothesis turns out to be completely false, it is still logically possible

- and, according to the best available evidence, very likely - that the disturbance of the developmental patterns of interaction in natural communities has adverse and occasionally catastrophic consequences.

To understand the origins of the controversy we have to go back to a classic text by the great Spanish ecologist Ramón Margalef. Margalef noted, as did others before him, that as natural plant and animal communities matured after an initial disturbance (a fire, a plowed field, a landslide, a volcanic eruption, etc.), the number of species in such communities tended to increase until it reached a maximum and a characteristic “climax” community appeared. This climax community was believed to last until the next disturbance, regardless of when that disturbance occurred. The entire process of change is called “succession.” A typical plant succession in an abandoned field in New Jersey or Pennsylvania would begin with annual grasses such as foxtail and ragweed; these after one or two years would give way to perennial herbs, such as goldenrods and asters; Soon there would be clumps of brambles and other woody plants, and then the typical “early successional” trees—red cedar and black cherry—would grow from the seeds deposited by birds. After ten or fifteen years, other trees, such as red maples or oaks, could have sprouted from seeds from surrounding forests, and half a century after that, the oak-hickory forest would gradually give way to a climax plant community of trees. shade lovers: beeches, sugar maples and yellow birches.

For Margalef, this tendency of the succession towards a climax community (“mature” ecosystems according to his terminology) was one of the several strong evidences that the last stages of the succession are more “stable” than the first ones. Since he also believed that these final ecosystems were more diverse in species and in connections or interactions between species, he argued that this diversity was responsible for the greater stability of mature ecosystems - that the stability was a consequence of the network-like structure of the most complex communities. From this type of reasoning derived analogies such as the one already mentioned by Commoner, in which the strength of a late successional community was compared to that of a network. This hypothesis ended up being a commonplace for conservationists who were eager to justify with scientific reasons their originally emotional desire to protect the wealth of Nature in its entirety, including the apparently useless majority of species. As Goodman pointed out, there is a basic appeal [in] its underlying metaphor. It’s the kind of thing that people like, and want, to believe.”

However, as Margalef refined his hypothesis, five types of evidence combined to undermine the part of it described here. First, the results of many

[q] “Fox tail” in the original. It probably refers to the genus *Alopecurus*. N. from t.

[r] “Ragweed” in the original. Genus *Ambrosia*. N. from t.

[s] “Goldenrods” in the original. Genus *Solidago*. N. from t.

[t] *Juniperus virginiana*. N. from t.

[u] *Prunus serotina*. N. from t.

[v] *Acer rubrum*. N. from t.

[w] "Oak-hickory forest" in the original. "Hickory" refers to the American trees of the genus *Carya*, closely related to the European walnut trees (*Juglans*). *N. from t.*

[x] "Sugar maple" in the original. *Acer saccharum*. *N. from t.*

[and] "Yellow birch" in the original. *Betula alleghaniensis*. *N. del t.* different studies about terrestrial and aquatic ecosystems showed that diversity does not always increase with the development of the succession, especially in the final phases. Second, it was discovered that the process of succession is not always as schematic and regular as believed, and that the idea of a "climax" community, like most such abstractions, only partially reflects what we see in Nature. Third, investigations of plant associations by Cornell ecologist RH Whittaker and his colleagues tended to show that the discovered interdependence and interactions between species in mature communities had been somewhat exaggerated.

Fourth, a mathematical analysis carried out by Robert May failed to confirm the intuitively appealing notion, suggested by Commoner, that the greater the number of interactions, or connections, the greater the stability of the system. May's mathematical models worked in the opposite way: the more elements (species and interactions between species) there were, the greater the fluctuation in the size of the "populations" of the system when the application of a disturbance was simulated. In theory, he found that the most diverse systems should be the most delicate; they were those most at risk of collapsing following human-induced change.

Fifth, the evidence provided by conservationists themselves supported May and contradicted the original hypothesis: diverse and "mature" communities were almost always the first to collapse when subjected to severe human stress and were always the most difficult to protect. . On the other hand, Margalef's own brilliant description of species carrying out the early stages of colonization indicated that these residents of "immature" communities were typically resilient, opportunistic, and genetically variable, exhibiting adaptive behaviors, and high reproductive rates. . The most difficult organisms to eradicate included, among others, pest animals, weeds and common game prey.

As May and others well perceived, the diversity-stability hypothesis, in the restricted sense described here, was a case of reversal of cause and effect. The most diverse communities were typically those that had occupied the most stable environments for the longest periods of time. They were dependent on a stable environment - not the other way around. They did not necessarily produce the kind of short-term, internal stability that Margalef had assumed existed. The moral of this story underscores the poignancy of the conservation dilemma. In our enthusiasm to demonstrate the existence of a humanistic "value" for the world's splendid and diverse "mature" ecosystems - rain and cloud forests, coral reefs, temperate deserts and the like - we insist on the role that they were gambling on the immediate stabilization of their own environments (including the very populations that constitute them) against pollution and other effects of modern civilization. This was a partial distortion that not only caused less attention

to be paid to the real, transcendent and long-term values of those ecosystems, but also helped to obscure, for a time, their extreme fragility in the face of human "progress".

Many different kinds of 'stability' actually depend on maintaining biological diversity - the wealth of Nature. This is especially evident today in those places, often in the tropics, where soils are prone to erosion, loss of nutrients and the formation of reddish "laterite" crusts, as well as where desertification can occur; however, none of these effects, however fatal and long-lasting, is ever as easy to explain to laymen as the "stable network" hypothesis.

A much less complex example of exaggeration or distortion resulting from the drive to seek values for non-resources concerns game ranches in Africa. In the 1950s and 1960s it was first noted that capturing native bush and savanna wildlife could produce at least as much meat per acre as raising cattle, without the destruction of vegetation that always accompanies it in arid environments. This suggestion cannot be refuted on the basis of ecological theory, which recognizes that the dozens of different species of large native herbivores - such as gazelles, wildebeests, zebras or giraffes - eat different parts of the vegetation, or the same vegetation but at different times, and that therefore the environment can tolerate its native animals that graze and browse much better than an equal or lesser number of cattle that eat the same food. There is also no food tolerance problem here: Africans are used to eating and enjoying a wide variety of animals, ranging from rodents to bats, aardvarks, monkeys, turtles, snails, locusts and flies.

The weaknesses of this simple plan have only recently become apparent. Apart from the serious cultural problems related to the high social value of cattle in some African tribes, which makes these Africans reluctant to reduce the size of their herds, the biggest drawback is ecological. The original game ranch theory and subsequent "extraction" programs carried out by Ian Parker tacitly assumed that exploited populations would replace lost animals, or, put another way, that populations of wild edible herbivores would be able to adapt to a significant annual reduction caused by commercial hunting. This is certainly true for some of the most fecund species, but most likely not all species reproduce fast enough to withstand the pressure of this sustained mortality. The population dynamics and management ecology of almost all species are still largely unknown and exploitation, both legal and illegal, is taking place with little more than speculation about the long-term consequences. A recent ecological study showed that wildebeests need to forage en masse during their annual migrations to allow a lush tapestry of grass to appear a few months later that can be eaten by Thompson's gazelles. How many other similar relationships exist there of which we know nothing?

The problem here lies in the danger of assuming, with an air of infallibility, that the ecological effects of game management are known. This again is a manifestation of the arrogance of humanism: if animals are to be considered resources and worth saving, then they must be available for exploitation. However, our ignorance of the effects of such harvesting has been repeatedly underlined by Hugh Lamprey and some of those

who know best the ecology of East Africa. In his magisterial book *The Last Place on Earth*, Harold Hayes reviews these ecological arguments and beautifully illustrates many of them with an anecdote told to him by John Owen, a prominent former park manager in the Serengeti. Owen described the controversy over the return of the elephants (2,000 specimens) to the Serengeti and the alleged damage they were causing to the park's ecosystems. Should the elephants be exploited was the question to be decided - each side had its defenders.

When I returned from Arusa, the guards accompanied me to show me the lopped acacias. The next day, the scientists [ecologists from the Serengeti Research Institute] came with me to show me the new acacia saplings that were sprouting in another part of the park. The seeds of the acacias are carried by the elephants and fertilized with their dung.

Much of the problem today is poaching, and it has to be admitted that there is a remote possibility that ranching and large-scale game exploitation programs have the effect of making poaching (to make money from the sale of the skins) ceases to be profitable. However, there is also the possibility that ranching and game exploitation affect species diversity and ecosystem stability as much as poaching or even, in some cases, as much as cattle ranching. In our rush to protect zebras, wildebeests, dikdiks[aa] and springboksbb by endowing them with tangible humanist value, we may have exaggerated the kind of potential they have as resources (they have many others) and in the process we have further endangered.

[z] *Orycteropus afer*. N. of t.

[aa] Antelopes of the genus *Madoqua*. T.N.

[bb] Gazelles belonging to the species *Antidorcas marsupialis*. T.N.

One of the lessons from the examples above is that conservationists cannot rely on assumptions of power and the doctrine of final causes any more than other people can - they must not assume that an ecological theory can always be created. To support their cases, especially when those cases concern immediate humanistic goals and when the scope of the debate has been artificially restricted by a short-term cost-benefit approach. It is a grave mistake to assume that, since we are Nature's most striking creation to date, each of her other innumerable creatures and works can somehow be used for our benefit if we discover the key how to do it. As used by conservationists, this assumption is one of the most tender and well-intentioned humanist hoaxes; but falsehoods, even if they arise from good intentions, are still falsehoods.

Another example of a situation where ecological theories, if understood in a narrow context, do not support conservation practices is described by tropical ecologist Daniel Janzen:

One possible remedy [for the year-round persistence of agricultural crop pests and diseases in the tropics] is unpalatable to the conservationist. Agricultural potential in many seasonally dry parts of the tropics could well be enhanced by the systematic destruction of vegetation, both riparian and otherwise, which is often left for livestock shade, erosion control and conservation. It might be nice to replace the banyan[cc] with

a shed. ... Some studies even suggest that 'overgrazed' grasslands may have higher production than more carefully managed sites, ... especially when the real costs of management are taken into account.

That is, Janzen has shown here that it is quite possible for ecological theory to endow non-resources with a negative value, to turn them into economic burdens. In this particular case, long-term ecological considerations (such as ultimate erosion costs, soil nutrient loss, and other factors related to all of the items on the list above) would likely override long-term ecological considerations. short term described by Janzen. However, the net practical result of any conservationist attempt, based on ecological theory, to demonstrate the resource value of both streamside vegetation and other vegetation types in the seasonally dry tropics would be to expose the conservationist stance to an unnecessary attack.

I want to emphasize here that the purpose of this chapter is narrow: to demonstrate how pervasive humanistic assumptions contaminate and harm even the attempts of those who are busy combating the environmental consequences of modern humanism; as well as to identify non-humanistic, honest and lasting reasons to save Nature. This does not mean that I reject arguments based on the notion of recourse when they are valid. The Amazon rainforest, the green turtle, and many other forms of life are in fact resources; contribute greatly to the maintenance of human well-being. However, this is only one of the reasons for its retention, and it should be applied with care, if only because of the likelihood that it will end up undermining its own effectiveness.

Additional risks

Even though it is quite legitimate to find humanistic values for things that have traditionally been considered non-resources, from a conservation point of view it may be risky to do so. It just so happens that discovering a role as resources for these once worthless parts of Nature turns out to be a quasi-solution, and soon a

[cc] "Banyan tree" in the original. Common name for several species of the genus *Ficus*, also called "strangler fig trees". *N. from t.*

[dd] *Chelonia mydas*. *N. t.* bunch of residual problems. Ecologists J. Gosselink, Eugene Odum, and their colleagues have conducted research to discover the "value" of salt marshes along the southeastern coast of the United States, which - despite its scientific elegance - may serve to illustrate these risks.

The purpose of the project was to establish a defined monetary value for the salt marshes based on the tangible properties of the resources. Therefore, aesthetic values were not taken into account. The properties studied included the activity of the marshes in the removal of pollutants from coastal waters (a kind of tertiary treatment of wastewater) and in the production of fish for food and sport fishing (the marshes serve as a "nursery"). " for fingerlings), the potential for commercial aquaculture and a host of other functions that are difficult to quantify. The final value of an *intact* marsh was established at \$82,940 per acre. Although the computation was complex and speculative and could surely have been questioned by some ecologists, I am perfectly willing to accept it. The marshes are valuable.

Is drawing attention to this value the best way to conserve salt marshes? If a given marsh would be less valuable if put to possible use than if it remained in an intact state, the answer could be yes, provided that the marsh was not privately owned. However, discovering value can be dangerous: indeed, it means giving up any right to reject humanistic assumptions.

First, any possible use with a larger value, no matter how small the difference, would take precedence. Since many of the potential uses are irreversible, a further relative increase in the value of the marsh area would come too late. We don't generally demolish high-end apartment towers to restore tidal flats.

Second, values change. If, for example, a new method is discovered and sewage treatment suddenly becomes less expensive (or if sewage becomes valuable as a raw material), then we will find that the value of salt marshes is suddenly much less. than before

Third, the study assumes that all qualities of salt marshes, both valuable and worthless, are known and identified. In turn, this means that those coastal wetland qualities that are not assigned a conventional value are not important. This is a dangerous assumption.

Fourth, CW Clark has calculated that the quick benefits from immediate exploitation, even if they involve the extinction of a resource, are often economically superior to the kind of long-term, sustained benefits that could be produced by the intact resource. This economic principle has been demonstrated by the whaling industry, especially in Japan, where they have realized that the money made from the rapid extinction of whales can be reinvested in various "spreading" industries, so that the full benefits will be at the same time. greater than if the whales had been caught at a rate that would allow them to survive indefinitely. In other words, finding a value for some parts of Nature does not guarantee that it is *rational* for us to preserve it - it could be precisely the opposite.

Given these four objections, the risks of treating (even when legitimately done) non-resources as if they were resources become quite apparent, as do the risks of overemphasizing the cost-benefit approach in conserve even the most traditional and accepted resources. There is no true protection of Nature within the humanistic system - this idea itself is a contradiction.

There is another risk in assigning value as resources to non-resources: whenever "real" values are calculated it becomes possible - even necessary - to classify the various parts of Nature for the unholy task of determining a *priority* in conservation. Since dollar value, as in the case of salt marshes, is often not available, other classification methods have been devised that are supposed to be applied in a mechanical and objective way.

One such classification system has been developed by FR Gehlbach to value state park lands in Texas. The properties that are taken into account and summed in Gehlbach's system include "climax condition", "educational suitability", "species importance" (the presence of rare, threatened and locally unique species), "representativeness of communities" (the number and type of plant and animal communities included)

and “human impact” (both present and potential), in order of increasing importance. Gehlbach clearly believes that the numerical scores created by this system can be used, without additional human input, to determine conservation priorities. He says:

We suggest that if an area is offered as a donation [to the State of Texas], it be accepted only when its natural area score exceeds the average score for communities of the same or similar types in the natural area reserve system.

Other classification systems exist, both in Britain and the United States, and probably more will be developed.

There are two dangers in classifying the parts of Nature and both work against the uncritical or mechanical use of this type of system. First there is the problem of incomplete knowledge. It is impossible to know all the properties of something in Nature, and the more complex the entity (for example, a natural community) the less we know. It is tempting. For example, punching a hole in a computer card that labels a community a “lowland floodplain deciduous forest” and leaving it at that. However, such descriptions of communities, especially short and “factual” ones, are largely artificial abstractions; they are designed to make it easier to talk about vegetation, not to decide what to do with it. It is somewhat presumptuous to assume that any formal classification system can serve as a stand-in for personal knowledge of the land or as a stand-in for information-driven human feelings about its meaning or value in today’s world or in the world within a hundred years.

The second danger is that such a formal classification is likely to end up pitting Nature against herself in an unacceptable and wholly unnecessary way. Will we ever be asked to choose between the Texas Big Thicket and Palo Verde Canyon based on relative total scores? The need to conserve a particular community or species must be judged independently of the need to conserve anything else. Limited resources may force us to make choices against our will, but ranking systems encourage and justify them. There is a difference between the scientist who finds it necessary to kill mice in order to do research and the scientist who designs experiments to kill mice. Classification systems can be useful as decision aids, but the more formal and generalized they become, the more likely they are to cause harm.

There has only been one case in Western culture of a conservation effort greater than the one currently underway; It was about endangered species. Not a single species was excluded on the basis of low priority and, by all accounts, not a single species was lost.

Of the pure beasts, and of those that are not, and of the birds, and of everything that creeps on the earth, two by two entered the ark with Noah, the male and the female, just as God ordered Noah. (Genesis 7:8-9).

It is an excellent precedent.

Non-economic values

The attempt to preserve non-resources by finding an economic value for them produces a deadlock situation. Much of the value discovered for non-resources is indirect, in the sense that it consists in avoiding costly problems that might arise if the non-

resources were to disappear. This is the base of the quagmire. On the one hand, if the non-resource is destroyed and no disaster follows its disappearance, the argument for its conservation loses all credibility. On the other hand, if a disaster occurs after the extinction of the non-resource it may be impossible to show that there is a connection between the two events.

One way to avoid this quagmire is to identify the *non*-economic values inherent in all natural communities and species and give them at least equal importance to indirect economic values. The first of these universal qualities might be called the value of "natural art." It has been excellently articulated by the great naturalist and conservationist Archie Carr, in his book *Ulendo*:

If the Egyptians used the pyramids as quarries or if the French allowed scoundrels to throw stones at the Louvre, everyone would be furious. The same thing would happen if the Americans flooded the Colorado Valley with a dam. Reverence for the original landscape is one of the human qualities. It was the first of them. Considered in terms of how they both affect the human nerves and senses, there is no difference between a work of art and a work of nature. However, there is this difference. ... Any art could, in a way, be superseded one day - the complete symphony of the savannah landscape never.

This point of view is unusual and some need to get used to it, but it is apparently gaining popularity. In an article about Brazilian tamarins, or lion tamarins, three species of tiny, colorful primates of the Atlantic rainforests, AF Coimbra-Filho hinted at the notion of natural art in a frank and thoughtful statement remarkably similar to the quote above:

In purely economic terms, it doesn't really matter that these three Brazilian monkeys fade into extinction. Although they can be used as laboratory animals in biomedical research (and indeed were used before), much more abundant species from other parts of South America serve laboratories equally well or better. Lion tamarins can be exhibited in zoos, sure enough, but it is doubtful that most of the zoo public will miss them. No, it seems that the main reason for trying to save them and other animals like them is that the disappearance of any species represents a great aesthetic loss for the world as a whole. It can perhaps be compared to the loss of a great work of art by a famous painter or sculptor, except that, unlike man-made works of art, the evolution of a single species is a process that takes millions of years and it can never be duplicated again.

This natural art, unlike man-made art, has no economic value, directly or indirectly. No one can buy or sell it for its artistic quality; it does not always stimulate tourism, nor does ignoring it cause, for the same reason, any loss of goods, services or comfort. It is distinct from the values as a recreational or aesthetic resource described above and may apply to communities or species that would not cause any tourist to go a single mile out of their route to view them or to qualities that have never been revealed on casual inspection.

Despite being free from some of the problems associated with arguments based on the notion of resource, the rationale for conservation based on natural art is still, in its own way, a bit artificial and confusing. First of all, it leads to the kind of classification problems I discussed above. If the analogy with art is valid, we cannot expect all parts of Nature to have the same artistic value. Many critics would say that El Greco was a better painter than Norman Rockwell, but is the savannah of the Serengeti more artistically valuable than the pine forests of the New Jersey moors or the coastal dunes of Aimsdale-Southport in Lancashire? And if so, then what?

Even if we accept that the art-based rationale for conservation need not encourage such comparisons, there is still something wrong, since the concept of art

[ee] Genus *Leontopithecus*. *N. The natural t.* remains rooted in the same homo-centric, humanistic worldview responsible for bringing the natural world, including ourselves, to its current state. If the natural world is to be conserved merely because it is artistically stimulating to us, we continue to conserve it for selfish reasons. There is still an implicit condescension and superiority in the attitude of human beings, the kind parents, towards Nature, the cute but troublesome child. This attitude is not in keeping with the humbling discoveries in ecology or the kind of ecological worldview that emphasizes connectivity and the immense complexity of human relationships with Nature. Nor does it agree with the growing body of essentially religious sentiments that are approaching the same position - equality in that relationship - following an unscientific path.

the noah principle

Defenders of natural art have done us a great service by being the first to point out the unsatisfactory nature of some of the economic reasons put forward to support conservation. However, something more is needed, something that does not depend on humanist values. Charles S. Elton, one of the founders of ecology, has indicated another value as a non-resource, the ultimate reason for conservation and the only one that cannot be compromised:

The first [reason for conservation], which is usually not put first, is actually religious. There are millions of people in the world who think that animals have the right to exist and to be left alone, or at least not to be persecuted or extinct as a species. Some people will believe this even though it is quite dangerous for them.

This non-humanistic value of communities and species is the simplest of statements: they should be conserved because they exist and because this existence is itself the present expression of a continuing historical process of immense antiquity and majesty</ em>. The existence since time immemorial in Nature is considered to carry the inalienable right to continue existing. Existence is the only criterion of the value of the parts of Nature and the decrease in the number of existing beings is the best way to measure the decrease in what we should value. This is, as has already been said, an ancient way of evaluating “conservability” and, in its own right, deserves to be called the “Noahic Principle”, after the person who was the first to put it into practice. For those of us who reject the humanistic underpinnings of modern life, there is simply

no way to tell whether one arbitrarily chosen part of Nature is of more "value" than another part, so, like Noah, we don't bother trying.

Today, the idea of conferring rights on non-human forms of existence is becoming more and more popular (and is meeting more and more resistance). I will give only two examples. In a book entitled *Should Trees Have Standing?*^[ff] CD Stone has argued for the existence of legal rights to forests, rivers, etc., regardless of the inalienable interests of the people associated with these natural entities. Describing the land as "an organism, of which Humanity is a functional part," Stone extends Leopold's land ethic in a formal way, justifying such unusual lawsuits as *Byram River, et al. v. Village of Port Chester, New York, et al.* If a large company can have legal rights and responsibilities and access to the courts through its representatives ("legal status"), Stone argues, why not rivers? Stone's essay has already been cited in a minority decision of the US Supreme Court - not trivial. I doubt that your suggestion will go far unless humanism loses ground, but the weaknesses of the notion of legal status for Nature are not the point here; the mere appearance of this idea at this time is a significant event.

[ff] *Should trees have legal status? N. of the t.*

However, the other example of the Noah's Principle in action has been provided by Dr. Bernard Dixon in a short but insightful article on the case for the careful preservation of *Variola*, the smallpox virus, a Threatened species:

Since man is the only product of evolution capable of taking conscious steps, whether based on logic or emotion, to influence its course, we have a responsibility to see that no other species is annihilated... Some of us who might happily say goodbye to a virulent virus or bacterium might well have qualms about forever eradicating a "higher" animal - be it rat, bird or flea - that transmits such microbes from man. ... Where, moving up the scale of size and unsightly appearance (smallpox virus, typhoid bacilli, malaria parasites, schistosomiasis worms, locusts, rats...), does conservation become important? In fact, no line can be drawn. Each of the arguments advanced by conservationists is as applicable to the world of pest animals and pathogenic microbes as it is to whales, gentians, and flamingos. It can even be applied to the tiniest and most virulent of viruses.

Elsewhere in the article, Dixon makes a strong case for preserving the smallpox virus as a resource (though not for biological weapons); however, the non-humanist "existence value" argument is the one that matters most to him.

Charles Elton proposed that there are three different reasons for conserving natural diversity: because it is a right relationship between man and living things, because it provides opportunities for a fuller experience, and because it tends to promote ecological stability - ecological resistance to the invaders and the explosions in the native populations.

He stated that these reasons could be harmonized and that together they could generate a "wise principle of coexistence between man and nature." Since these words were written we have ignored this harmony of reasons for conservation, ignoring the

first reason (or religious reason) as embarrassing or ineffective and basing ourselves on rational, humanistic and "rigorously scientific" tests for values.

I am not trying to discredit all economic or selfish uses of Nature nor recommending the abandonment of resource-based motives for conservation. Selfishness, within limits, is necessary for the survival of any species, including ours. Furthermore, if we were to rely solely on non-resource motivations for conservation, we would discover, given the present state of opinion and the world's material aspirations, that there would soon be nothing left to conserve. However, we have been too careless in our use of recourse arguments - distorting and exaggerating them for short-term purposes and allowing them to confuse and dominate our long-term thinking. Resource-based reasons for conservation can be used as long as they are sincere, but they must always be presented alongside non-humanistic reasons, and it should be made clear that the latter are more important in all cases. And when a community or a species has no known economic value or any other value to humanity, it is as dishonest and unwise to invent weak values based on the notion of a resource for it as it is to abandon any attempt to conserve it. Their non-humanistic value is enough to justify their protection - but not necessarily to guarantee their safety in this human-obsessed world culture.

I have tried to show in this chapter the devilishly intricate and cunning character of the humanistic trap. "Do you love Nature?" they ask. "Do you want to save her? So tell us what it's for." The only way to escape this type of trap, if there is one, is to tear it apart, reject it completely. This is the ultimate realism; sooner or later we will have to get to it - the sooner we do it, the less it will hurt.

Non-humanistic arguments will gain the weight they deserve only after cultural attitudes have changed. Morally backed missionary movements like humane societies are doing pretty well these days, but I am under no illusions about the possibility of ethical change in our Faustian culture unless pushed to do so by some general catastrophe.

Not all problems have acceptable solutions; I feel that this is one of these cases. On the one hand, conservationists will generally not be successful using the resource-based approach alone; and often they will even harm their own cause. On the other hand, a combination of humanist and non-humanist arguments like Elton's can also fail, and if it succeeds, it is probably due to forces that conservationists *never expected nor controlled*, as Mumford points out in "Prospect":

Often the most significant factors in determining the future are the irrational ones. By "irrational" I do not mean subjective or neurotic, since from the point of view of science any small amount or single occasion can be considered irrational, as long as it does not lend itself to statistical treatment and repeated observation. Accordingly, we must accept, when considering the future, the possibility of miracles... By miracle, we do not mean something out of the order of nature but something that happens so infrequently and that brings about such a radical change that nobody you can include it in any statistical prediction.

However, should such an unexpected change in cultural attitudes occur, those of us who have already rejected the humanistic idea of Nature will at least be prepared to take advantage of favorable circumstances. And whatever the outcome, we will have had the small private satisfaction of being honest for a while.

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¹ There is an edition in Spanish: "An almanac of the sandy county" in *An Ethics of the Earth*, Los Libros de la Catarata, 2000. *N. from t.*

Presentation of "The shaky ground of sustainable development", "The ecology of order and chaos" and "Restoring the natural order"

We present below the translation of three successive chapters of the book *The Wealth of Nature: Environmental History and the Ecological Imagination* by Donald Worster. We have selected these three chapters because we have found them to be the most interesting in the book and, although they make sense separately, they should be read in order for a better understanding.

Worster is an American historian and environmentalist who tries to show in these articles what is behind some modern concepts and ideologies that question the supposed traditional vision of Nature and the relationship of human beings with it. What hides ideologies such as the ecology of chaos or others related, such as postmodernism, relativism, etc., is actually a justification for the destruction and subjugation of the wild, while promoting techno-industrial development. It seems as if, even within environmentalism, the goal of preserving wild Nature in the face of advancing technological progress is being abandoned due to the difficulty of achieving it, while ideologies are being generated that justify said advance and abandonment. Concepts such as "sustainable development", "environment" or more elaborate arguments such as the ecology of chaos, postmodernism, etc. they do nothing but generate confusion about the intrinsic importance of wild Nature and Worster tries to show it, with greater or lesser success, in these texts of his. This is one of the greatest successes of these articles and that is why we have made these translations.

Still, there are some aspects of Worster's ideas that we feel are wrong, and we'll briefly discuss some of the more important ones below.

- As we have already pointed out on other occasions, conservationists tend to fall to a greater or lesser extent into idealism, understood as the fact of giving excessive importance to ideas, values and wills and, in a complementary way, to underestimate the importance of material and objective factors when determining the development of social systems, and specifically, in the case at hand, the relationships of societies with Nature and its effects. Conservationists are often right when it comes to seeing ecological problems and recognizing the value and importance of wild Nature, but

when it comes to identifying the causes of these problems and proposing solutions to them, they are often quite wrong. . Few are those who identify *mainly or exclusively* material factors, such as human population or social and technological development, as the fundamental causes of ecological problems and the subjugation of wild Nature. The majority, although they certainly recognize these material factors, consider them secondary, effects of mistaken ideologies or mentalities, such as anthropocentrism or the desire to dominate Nature, and not the other way around (it is these ideas and attitudes that are only effects that at most they reinforce certain tendencies of material social or technological development, but they are not the ultimate causes of it). So when it comes to proposing solutions, they focus on changing the ideas and values of people and society, instead of directly attacking these material factors.

And Worster, despite his lucidity in many other respects, also falls into idealism to some extent. For example, when he considers in the third article, that industrialism is a product of the mind (will, ideas, values) of the individuals (capitalist entrepreneurs) who founded it in the 7th and 8th centuries. What this does not explain is where these ideas came from, in what material context they appeared or why then and there and not in another time and place, and why they were those and not others.

And, of course, when he tries to propose solutions to the disaster caused by industrialism in Wild Nature, following the same idealistic logic, he proposes a change of mentality (adopting the “aesthetic understanding” and adopting a conservationist ethic), instead of a radical change of the conditions and material factors that physically determine the existence and development of the techno-industrial society.

- Also, in relation to his idealism, it should be noted that Worster seems to confuse and equate the popular notion of “materialism” as “desire and excessive valuation of material goods” and the philosophical notion of said term as “subordination of the aspects and factors non-material with respect to material aspects and factors in cultures and their development”, when both notions are not necessarily related. In fact, most modern consumerists (“materialists” in the first sense of the term) are actually idealists (ie, the opposite of “materialists” in the second sense of “materialism”).

- Another defect of Worster is his idealization of the environmentalism of the 60s and 70s. In our opinion, neither at that time was environmentalism, in general, as radical, lucid and honest as Worster paints it, nor is it very different today than it was then. In fact, today’s environmentalism is simply, to a large extent, the logical development of the environmentalism of then. Or put another way, the germ of reformism, of the “green” ideology, of environmentalism, of eco-technophilia, etc. I was already in that movement from the beginning. The majority of this movement was never against modern technology, but advocated achieving a “balanced” and “ecologically and socially correct” technological development that respected and did not excessively damage the human environment (which is not necessarily the same as Nature). In addition to that, the ecologists who valued wild Nature then (conservationists) were, as now, a minority within the whole of environmentalism, which is mostly environmentalist, that is, it cares about the environment, not about Nature. .

- Finally, and also closely related to idealism, would be the conservationist idea that it is possible to achieve a balance between technological and social development and the preservation of wild nature. Because they underestimate the importance of material (physical) factors, conservationists often believe that it is possible to reconcile the maintenance and development of techno-industrial society with the preservation and recovery of wild Nature on Earth. According to them, it would be enough to “progress morally”, that is, to adopt values, ethics, and morality that take Nature into account. However, there are physical limitations that make it impossible to achieve such a balance. If the techno-industrial society continues to exist, and even more so if it grows, wild Nature will decrease, whatever the prevailing ideas in the former. And, vice versa, if wild Nature is to be preserved, and even recovered, the techno-industrial society should disappear. There are no “moral progress” worth.

The shifting terrain of sustainable development

By Donald Worster

The first thing I know when I start climbing a mountain is where the top is. The second is that there are no ways to achieve it that are completely free of suffering. Not being able to know these things can lead one to follow a deceptively easy path that never reaches the summit but zigzags endlessly, frustrating the climber and wasting his energy.

The popular and current slogan of “sustainable development” threatens to become just such a path. Although attractive at first glance, it is especially appealing to people who are put off by the long, arduous trek ahead of them or who really don’t have a clear idea of what the main goal of environmental policy should be. After much wandering and confused and heated arguing, they have discovered what looks like a wide, easy path that all sorts of people can walk at once and rush to follow, unaware that it may be going in the wrong direction.

When modern environmentalism first emerged in the 1960s and 1970s, and before its goals were clouded by political concessions and blurring, the end was more apparent and the path forward clearer. The goal was to save the living world around us, the millions of existing plants and animals, including humans, from the destruction caused by our technology, our population, and our appetites. The only way to do that, it was all simple enough to see, was to adopt the radical thinking that there must be limits to growth in three areas: limits to population, limits to technology, and limits to appetite and greed. Underlying this idea was a growing awareness that the secular, materialistic, progressive philosophy on which modern life rests, on which indeed Western civilization has rested for the last three hundred years, is profoundly flawed and ultimately destructive to us, ourselves and for the entire fabric of life on the planet. The only true and certain way to reach the ecological goal, therefore, was to question this philosophy from its foundations and find a new one based on material

simplicity and spiritual wealth -find other reasons to live different from production and consumption.

I'm not saying that this conclusion was shared by everyone who called themselves an environmentalist at the time, but it was clear to the more thoughtful leaders of the movement that this was the path we should take. However, since it was so painfully difficult to make such a change, since it meant going in a direction diametrically opposed to the path we had been following, many began to look for a less demanding path. By the mid-1980s, such an alternative had appeared, it was called "sustainable development." It first appeared in the *World Conservation Strategy*[b] of the International Union for Conservation of Nature[c] (1980), then in the book *Building a Sustainable Society*< /em>

[a] Translation by Último Reducto from "The Shaky Ground of Sustainable Development", chapter 12 of *The Wealth of Nature: Environmental History and the Ecological Imagination*, Oxford University Press, 1993. Copyright © 1993 Donald Worster. *N. from t.*

[b] "*World Conservation Strategy*" in original. *N. from t.*

[c] "International Union for the Conservation of Nature" in the original. *N. from t.* by Lester R. Brown, from the WorldWatch Institute (1981), then in another book: *Gaia: An Atlas of Planet Management*, edited by Norman Myers (1984) and after most influentially in the so-called Brundtland Report, *Our Common Future* (1987), directed by Gro Harlem Brundtland, Norwegian Prime Minister and chair of the World Commission on Sustainable Development. The appeal of this alternative lies in its international political acceptability by both rich and poor nations, in its potential to achieve a broad coalition among many warring countries. As Richard Sandbrook, executive vice president of the International Institute for Environment and Development, explained: "It hasn't been too difficult to bring together the environmental lobby of the North and the pro-development lobby of the South. And now there is actually a blurring of the differences between the two, so that they are going to reach a common consensus around the issue of sustainable development".¹

So: a lot of lobbying coming together and a lot of blurring going on, inevitably resulting in a lot of shallow thinking. The North and the South, we were told, could now make common cause without much difficulty in favor of a new, more progressive environmentalism. Capitalists and socialists, scientists and economists, the impoverished masses and the urban elites could now happily march together on a straight and easy path, as long as they did not raise any serious questions about where they were going.

Like many other popular slogans, sustainable development has worn thin after a while, revealing the lack of fundamental new ideas. Although it seems to have gained wide acceptance, it has done so by sacrificing the true essence. Worse yet, the slogan

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

may turn out to be inappropriate for environmentalists to use as it may lead us hopelessly back to using superficial economic language, relying on output as the criterion of judgment, and following the progressive materialist worldview in understanding and use the land, all of which was precisely what environmentalism intended to bring down at the time.

My own preferences are for an environmentalism that talks about ethics and aesthetics rather than resources and economics, that prioritizes the survival of the living world of plants and animals regardless of their productive value, that appreciate what the priceless beauty of nature can contribute to our well-being in more profound ways than mere economics. I will return to that alternative later, but first I want to reveal more fully the shifting terrain of sustainable development. To date we have not had a deep analysis of this slogan, despite all those books and reports mentioned above. Although I myself cannot offer a complete analysis of it here either, I want to draw attention to the important issue of language, the words we put together to capture our ideals, and, above all, to ask what is implied by that magic word of consensus, "sustainability".

We do not have a complete history of the word, but its origins seem to go back to the concept of "sustained extraction"[d] that appeared in Germany in the late 18th and early 19th centuries. Germany depended on its forests in the most essential sense, for the wood needed to sustain its economy, and these forests were in decline—reducing in extent due to overexploitation and disappearing as the population increased. Fear of impending resource depletion, poverty, and social chaos pushed some citizens to seek

[d] "Sustained-yield" in the original. *N. t.* a solution based on the authority of science. They began to talk (the exact date is not yet clear) about *managing* the forests so that periodic removals matched the rate of biological growth. Science, they believed, could reveal this rate, thus indicating precisely how many trees could be felled without depleting the forests themselves or undermining their long-term continuity. It was a hope based on a vision of the natural world as a stable and enduring order, a vision with Newtonian roots, in which even the growth of a complex entity like a forest followed a regular and predictable cycle on a map.

Science, according to this ideal of "sustained extraction," could become the basis of continued prosperity, a tool for economic growth, and thus could lay the foundations for a lasting social order. Laws and regulations governing extraction could be made scientific, and experts in the science of biological growth could become the architects of a more secure nation. Robert Lee argues that the Germany of that period was not yet the "stable, hierarchical, stratified, and highly structured society" that it would later become, but rather was still divided into rival religious faiths, Protestant and Catholic, and it had been devastated by a long period of war and rebellion and by many anti-social encroachments on private resources. "Sustained extraction," he writes, "seems to

have been a response to uncertainty and instability...[I]t was an instrument for ordering social and economic conditions.”²

Americans such as Bernhard Fernow (1851-1923), an immigrant from Germany, and Gifford Pinchot (1865-1946), the first Chief Forest Engineer in the Department of Agriculture, imported the theory of sustained extraction into the United States. in environmental management during the last two decades of the nineteenth century. Fernow, who was of Prussian origin, had studied sustained logging techniques at the Prussian Forestry Academy in Munden and was critical of the *laissez-faire* economics of his adopted country. Forest resources, he explained, can deteriorate under the active competition of private enterprise and their deterioration can adversely affect other conditions of material existence; . the maintenance of a continuous supply and favorable conditions is possible only under the supervision of permanent institutions for which present benefit is not the sole motive. It pre-eminently requires the exercise of the providential functions of the state to counteract the destructive tendencies of private exploitation.³

The German notion of the state as a necessary counterweight to the anarchic and short-term thinking of *laissez-faire* capitalism was a key part of the idea of sustained extraction. Pinchot, who had studied at the French Forestry School in Nancy and examined model forests in France, Germany and Switzerland, also believed that the state, guided by trained professionals like himself, should play an active role in managing natural resources. of the nation in order to ensure a sustainable future. For both men, nature was little more than a utilitarian good to be managed and harvested for the common good. They had completely absorbed the dominant worldview of their time, which dictated that the main goal of social life is economic progress - constantly increasing production in the long run - adding only the corollary that such production should be directed by the state and its subordinates. experts to prevent the destruction of the organic social order.

”Sustainable development” is therefore not a new concept but has been around for at least two centuries; it is a product of the European Enlightenment, is both progressive and conservative in its impulses and uncritically reflects modern faith in the ability of human intelligence to manage nature. The only thing that the Brundtland Report and other recent documents have new is that they have spread the idea *around the globe*. Now it is Planet Earth, and not merely a beech forest, that has to be managed by qualified minds, by an eco-technocratic elite. Though never explicit, contemporary advocates of sustainable development are pushing a political ideal alongside an environmental policy: one that advocates a more centralized authority that can disinterestedly manage the entire global ecosystem. Neither large capitalist corporations

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The ”geo” for the Earth and the ”physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

nor traditional rural communities can be trusted, they suggest, to single-handedly find a sustainable path to the pinnacle of universal abundance.

I cannot help but agree that a world of aggressive nations and individuals seizing resources for their own selfish enrichment, regardless of how others fare, is doomed to end in violence. Nor can I disagree that it will cause ecological degradation that will eventually sink us all. Multinational corporations are taking us down this path at full speed, while the small rural villages of the past are fading away and seem powerless to prevent this outcome. However, can we really trust the state and its scientific experts to save us from this situation and show us how to successfully manage a global ecosystem 12,800 kilometers in diameter and 500 million square kilometers in extent, and teach us how to make it produce more and more, until all human beings on earth enjoy a life of princes, and all this without destroying its capacity for renewal? The ground on which this hope rests is dodgy ground.

Sustainability, to begin with, is an idea that has never been well defined. Until we have a clearer consensus about it, we cannot know what is being promised or what is being sought. Consider the issue of time frame. What society is sustainable? A society that lasts a decade, one that lasts a human life, or one that lasts a thousand years? If we want to give more authority to development experts it is not enough for them to merely say “sustainable for a long period”, or even “for the next generation”. On the other hand, no one really expects sustainable to mean “forever and ever”; this would be a utopian expectation that no society has ever achieved. If we can’t expect to achieve *perfect* sustainability that lasts forever, then what can we expect? What can we try to achieve? What *degree* of sustainability should we establish? Nobody, to my knowledge, has yet given a definitive answer.

In addition to not offering us a clear time frame, the ideal of sustainability is presented to us with a bewildering multiplicity of criteria and we have to choose which ones we want to emphasize before we can develop any concrete program of action. Among the dozens of possible sets of criteria, three or four have dominated the discussion in recent times, each one of them based on a different field of knowledge and with very little common ground.⁴

The field of economics, for example, has its own peculiar notion of what sustainability means. Economists focus on when societies reach a starting point for continued, long-term growth, investment, and profit in a market economy. For example, the United States reached that point around 1850, and has been growing steadily ever since, despite a few recessions and depressions. According to this criterion, any or all of the

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

industrial societies are already sustainable, while the backward agrarian societies are not.⁵

On the other hand, scholars of medicine and public health have a different notion of the world; sustainability is for them a state of individual physiological well-being, a state that can be measured by doctors and nutritionists. Therefore, they focus on the risks of water and air pollution or the availability of food and water; or talk about the threat that shrinking gene pools pose to the practice of medicine and the supply of drugs. Despite the existence of many such threats today, most health experts would admit that great strides have been made around the world in human health over the last few centuries. Consequently, according to their criteria, the state of humanity is much more sustainable today than it was in the past - a fact that is demonstrated by the explosive growth of the population and the life expectancies of the majority of the societies. By the criterion of physiological fitness, people living in industrial societies are doing much better than our ancestors or our peers living in non-industrial societies.

Another group of experts, political and social scientists, speak of "sustainable institutions" and "sustainable societies," which seems to refer to the ability of institutions or leading groups to command sufficient public support to renew themselves themselves and stay in power.⁶ So, sustainable societies are simply those that are capable of reproducing their political and social institutions, without discussing whether the institutions are good or bad, compassionate or unjust. According to this way of reasoning, the communist regimes in Eastern Europe and the Soviet Union have not proven sustainable and have been thrown into the dustbin of history.

These are all prominent and important uses of the term that can be found in various fields of knowledge, and undoubtedly all of them can be defined in very sophisticated ways (and much more precisely than I have indicated here). Contrary to this, we also have some simpler and more popular notions of the term. One of the clearest, succinct, and least complicated definitions is the work of Wendell Berry, an American writer and scathing critic of anything that sounds expert. Specifically, he defends a more sustainable agriculture than we have today, referring to an agriculture that "does not deplete the soil or the people."⁷ This phrase expresses, as does much of Berry's work, an old-fashioned agrarian way of thinking, steeped in the folk history and local knowledge of their rural Kentucky neighbors. Like everything Berry writes, it has a concise, elementary air and the great virtue of drawing our attention to the fact that people and the earth are interdependent, a fact that the specialized approaches of economists and other scholars generally overlook. .

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

⁷ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

According to Berry, the only truly sustainable societies have been small-scale agrarian ones; no modern industrial society can choose to be. His own model, based on the livelihoods and culture of the Jeffersonian farmer, must be seen as part of the economic past; it has virtually disappeared from modern American life. One might wonder, as Berry's critics often do, if he is not offering us more myth than reality: Did such non-depleting rural communities ever really exist in the United States, or are they just idealizations or indulgent products of a false nostalgia? However, even if we accept Berry's differentiation between "sustainable agricultural" and "unsustainable industrial", it is not clear what the prerequisites for sustainability, or the measures of its success, would be. What meaning can we give to the idea of "people exhaustion"? Is it a demographic or cultural idea? How much self-sufficiency or production by the local community does it require and how much market exchange does it allow? In fact, what does Berry mean by his notion of soil depletion? Pedologists point out that the United States has lost, on average, half of its topsoil since white settlement began; but many of them also add that said soil loss will not be a problem as long as we can compensate it with chemical fertilizers. Once again we find ourselves in the quagmire of deciding who are the experts whose knowledge, language and values define sustainability. Berry would reply, I suppose, that we should let local people define it, but national and international rulers will want something that is more objective.

All these definitions and criteria are floating in the air today, confusing our language and our thinking, demanding much more than an agreed meaning before we can achieve concerted environmental action programmes. Indeed, there is a broad implication in the literature I have cited that sustainability is at bottom *an ecological concept*: the goal of environmentalism should be to achieve "ecological sustainability". What this means is that the science of ecology is expected to cut through all that confusion and define sustainability for us; it should point out which practices are ecologically sustainable and which are not. Once again we are faced with the task of seeking a set of expert and objective responses to guide policy. But how much do those ecology experts really help? Do they have a clear definition or set of criteria to offer? Do they even have a clear and coherent perception of nature that they can offer as a basis for international action?

Ecologists have traditionally approached nature as a series of overlapping biological systems or ecosystems. Contrary to most economists, for whom nature is not a relevant category for analysis, they have insisted that such systems are not disorganized or useless, but rather self-organizing and producing many material benefits that we need. The role of ecologists, therefore, as we have come to understand it, is to reveal to ordinary mortals how ecosystems, or their modifications in the form of agrosystems, withstand the stress of human demands and help us determine the critical point when the stress becomes so severe that they collapse.

If we accept this expert tutelage, the ecological idea of sustainability becomes, quite simply, a new way of measuring production, rivaling that of the economists: a measure of productivity in nature's economy where we find consumption objects such as soils,

forests and fisheries and a way to measure the capacity of that economy to recover from stresses, avoid collapse and maintain production. Unfortunately, compared to economists, ecologists have lately become very insecure about their own role as advisers. His stress and collapse rates have been called into question and his expertise is in question.

A few decades ago, ecologists commonly believed that nature, if left free from human interference, eventually reached a state of stability or equilibrium in which production was maintained at a constant rate. The origins of this idea go back to the hidden depths of human memory, to the remote past of all pre-modern civilizations. Especially for Westerners, the idea of a nature understood as a balanced order has antecedents in the ancient Greeks, medieval Christianity and the rationalism of the eighteenth century and even survived the profound intellectual revolution caused by Charles Darwin and the theory of evolution. by natural selection. Since it appeared in the late 19th century, the science of ecology echoed that ancient faith in the essential ordering of nature, and until recently almost all ecologists would have agreed that sustainability was about accommodating the human economy. to that constancy and that order. Today that is no longer the case.[537]

Back in the 1970s, ecology began looking for new ways to describe the planet's forests, grasslands, oceans, and every other biome, and the result is the emergence today of a more permissive set of ideas that rejects virtually all notions of stability, balance, constancy and order, whether new or old, and instead portrays a nature that is far more forgiving of human activity. We live in the midst of a nature that has undergone profound and constant changes for as long as we can imagine, experts now argue with the help of scientific techniques; we are faced with a nature populated by rude individualists, aggressive opportunists and ambitious egoists. In such nature there is no integrated community, nor a lasting system of relationships; there is no interdependence. Indeed, it appears that the sun rises regularly each day and at predictable points; the four seasons come and go with great regularity. However, pay no attention to all that, we are told; look at the populations of plants and animals that live in any given area that we may call wild, virgin, or natural, and you will discover that there are no regularities, no constancy, and no order at all.

Many of these ideas appear in a recent book entitled *Discordant Harmonies* (1990)[e], which describes itself as “a new ecology for the 21st century”. Here is how its author, Daniel Botkin, a famous Californian ecologist, sees the current state of science:

Until a few years ago, the prevailing theories in ecology either presupposed or considered as a necessary consequence a very strict concept of an ecological system in a highly structured, ordered and regulated stable state. Scientists now know that this view is wrong at the local and regional levels...that is, at the population and ecosystem levels. The change now appears to be intrinsic and natural in the biosphere on many scales of time and space.

“ Wherever we try to find constancy” in nature, Botkin writes, “we discover change.”[538]

The basis for this new ecology is a body of evidence that is essentially historical, including pollen samples, tree rings, and animal population cycles, all of which show that the natural world is in flux. constant, as unstable as the human world, in which wars, assassinations, invasions, economic crises and social disorder of all kinds constitute the only normal state we know.

For example, we can look at the history of a small old-growth forest in New Jersey that was preserved from development in the 1950s by assuming that it was a surviving remnant of old-growth climactic forest, dominated by oak and hickory[f] that in their day they grew in the area. Scientists suppressed forest fires to keep it virgin and undisturbed. In the 1960s, however, they began to discover that maples from outside were encroaching on their reservation. If they suppressed all the fires, if they tried to keep their forest “natural”, they were doomed to fail. So, they were forced to ask, what was the equilibrium state in this habitat? What was the true order of nature?

Another clue comes from pollen extracted from the sediments of ponds and lakes throughout North America and, indeed, on all major continents. The pollen shows that all areas of the Earth have experienced wide variation in plant cover from year to year and century to century, as well as from glacial to interglacial. When the great ice caps covered the North American continent, all the plants retreated south or into the lowlands - and it was not the orderly retreat of a superorganism constituted by an organized community, but a chaotic disbandment. Then, when the glaciers retreated, leaving the land bare, those same plants carried out a messy and chaotic invasion of their former territory. There was no organized return of the communities.

According to Botkin:

Nature undisturbed by human influence is more like a symphony whose harmonies emerge from variation and change across all intervals of time. We see a landscape that is always in flux, changing across many scales of time and space, changing with individual births and deaths, with local disturbances and recoveries, with large-scale responses to the climate of one ice age or another. and with the slowest soil alterations; and with even greater variations between ice ages.⁸

However, Botkin makes a very notable amendment to this statement when he adds that “the symphony of nature” is more like several compositions that were played simultaneously in the same room, “each with its own rhythm and cadence”. And so he comes to what is really the practical conclusion of his ecology for rulers, environmentalists and promoters of development: “We are forced to choose between these [compositions],

⁸ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

which we have only just begun to listen to and understand.” Or, it could be said, that after learning to listen to all those discords of nature, human beings have to assume the role of directing the music. If there is to be any order in nature, it is our responsibility to achieve it. If there is to be any harmony, we must overcome apparent discord. “Nature in the 21st century”, concludes this scientist, “will be a nature made by us”. It is to such a conclusion that Botkin’s science has been leading him all along: to a rejection of nature as the norm or criterion for human civilization and to a defense of a human right and need to order and shape nature. We are arriving, he proclaims, at a new notion of Earth “in which we are a part of a living and changing system whose changes we can accept, use and control to make the Earth a comfortable home, for each of us individually.” and for everyone collectively in our civilizations.” I believe that this new turn in ecological science towards revisionism and relativism is motivated, in part, by a desire to be less critical of economic development than environmentalists were in the 1960s and 1970s. Botkin criticizes that time for his radical, sometimes hostile rejection of modern technology and progress. He believes that we need a science of ecology that approaches development “in a more constructive and positive way”⁹.

These conclusions constitute what I would call a new permissiveness in ecology - more permissive of human desires than was traditional, pre-1970s ecology, and emphatically more permissive than was the ecological mindset of ecologists in the United States. the 1960s and 1970s. This new ecology makes human needs and desires the main criteria for deciding what should be done with the land. He denies that one can find in Nature, past or present, any criteria, much less a limit, for such desires. Botkin alludes to this denial early in his book when he criticizes the environmentalism of the 1960s and 1970s as “essentially a disapproving and, in this sense, a negative movement, denouncing those aspects of our civilization that are bad for our environment...” . What we need to do, he says, is to get away from this critical environmentalism and move towards a position “that combines technology with our concern about our environment in a constructive and positive way”.¹⁰

This new spin on ecology presents several difficulties that I don’t think advocates of sustainable development have really taken into account. First, the idea, taken as a whole, of a normal ‘output’ or ‘yield’ drawn from the natural economy becomes, if we follow Botkin’s reasoning, much more ambiguous. Scientists once believed that they could relatively easily determine the maximum sustainable yield that a forest or fishery could provide. They just had to determine the population in the steady state

⁹ For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

¹⁰ For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

of the ecosystem and then calculate how much fish they could catch each year without affecting the remaining population. They could get the interest without spending the initial fixed capital. Botkin asserts that it was just that trust that led to overfishing in the California sardine industry¹² - and to the complete collapse of that industry in the 1950s.¹¹

However, if the natural populations of fish and other organisms are constantly fluctuating in such a way that we cannot set maximum sustainable harvest amounts, could we instead set the more flexible criterion of “optimal production”, which would allow us some margins? of error and a more generous fluctuations? That is where most of the thinking about ecological sustainability today resides. Extract goods from nature, but do so at a slightly reduced level to avoid putting too much pressure on a system that is changeable and stochastic. Call this option the safe optimum. However, this formula does not really address a more basic challenge implicit in recent ecological thinking. What can “sustainable use”, let alone “sustainable development”, mean in a natural world subject to so much disturbance and chaotic turbulence? Our ability to predict, ecologists say, is much more limited than we imagined. Our understanding of what is normal in nature now seems arbitrary and biased to many.

The only real guidance Botkin offers us, and this is equally true for most ecologists today, is that slow rates of change in ecosystems are “more natural” and therefore more desirable than fast rates. . “We have to be careful,” Botkin tells us, “when we manipulate nature at an unnatural pace and in novel ways.”¹² And this is all it offers us. However, when we need more concrete advice, the ecologist remains embarrassingly silent; it can hardly tell anymore what is “unnatural” or what is “novel” in light of the incredibly shifting record of earth’s past.

In the much-vaunted partnership between ecological sustainability advocates and development advocates, who will lead whom? This is the most important question to ask about the new path that so many want us to take. I am afraid that in that partnership it will be the “development” side that makes most of the decisions and that the “sustainable” side will trot after it, smiling and cheerful, unable to establish firm leadership and complaining only about the pace of the journey. “You must go slower, my friend, you are going too fast for me. This is a good path to progress, but we must move at a more ‘natural’ speed.

In the absence of a clear idea of what a healthy nature consists of, or of how threats to the whole biological community could affect us, we will end up depending on utilitarian, economic and anthropocentric definitions of sustainability. That is where, it seems to me, is the crux of the matter at this point. Sustainability is, above all, an economic concept about which economists are clear and ecologists are not. If this conclusion is unacceptable to you, as it is to me, then you should try to change the elementary terms of the discussion.

¹¹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹² Examples:

I find the following flaws in the idea of sustainable development:

First, it is based on the notion that the natural world exists primarily to serve the material needs of the human species. Nature is nothing more than a set of "resources" to be exploited; it has no intrinsic meaning or value apart from the goods and services it brings to people, rich or poor. The Bruntland Report makes this point abundantly clear on every page: the "our" in its title refers to people only, and the only moral issue it raises is the need to share natural resources more equitably among our own species, among the world population today and with future generations. This is not an insignificant goal, but it is not up to the challenge.

Second, sustainable development, while acknowledging certain kinds of limits to material demands, depends on the assumption that we can easily determine the carrying capacity of local and regional ecosystems. Supposedly, our knowledge is adequate to reveal the limits of nature and to exploit resources safely up to that level. Given new arguments suggesting how turbulent, complex, and unpredictable nature is, that assumption seems overly optimistic. Moreover, in light of the tendency of some leading ecologists to use such arguments to justify a more accommodative stance on development, placing too much faith in their ecological expertise seems doubly dangerous; they are experts who lack any consensus about what the limits are.

Third, the ideal of sustainability rests on an uncritical and unquestioning acceptance of the traditional worldview of secular and progressive materialism. Consider this worldview something entirely benign as long as it can be sustained. The institutions associated with such a worldview, including those of capitalism, socialism, and industrialism, are also beyond criticism, beyond detailed scrutiny. It is about making us believe that sustainability can be achieved by leaving these institutions and their values intact.

Perhaps my objections can be fully answered by the defenders of the idea of sustainable development. I suspect, however, that your answer will be based, at heart, on the argument that the idea of sustainable development is the only kind of politically acceptable environmentalism that we can hope for at the moment. It is desirable simply because it represents consensus politics.

Having been so critical of this easy, sloganeering alternative, I feel compelled to conclude with a few thoughts of my own on what a real solution to the global crisis will require. I assume that it will be more difficult to achieve, but I would say that its impact is more revolutionary and that it will be more morally advanced.

We must make our highest priority in dealing with the earth the careful and strict preservation of the billion-year heritage achieved through the evolution of plant and animal life. We must preserve as many species, subspecies, varieties, communities and ecosystems as possible. We must not, through our actions, cause the extinction of any other species. It is true that we cannot stop all death or extinction, because the death of living beings is an inevitable part of the functioning of nature, but we can avoid adding more to that fateful result. We can stop reversing evolutionary processes like we do today. We can work to preserve as much genetic variety as possible. We can save

threatened habitats and restore those that are necessary to maintain the evolutionary heritage. We can and should do all this mainly because the living legacy of evolution has an intrinsic value that we have not created, but only inherited and enjoyed. This legacy requires our respect, our sympathy and our love.

It is unquestionable that we have the right to use this legacy to improve our material state, but only after taking, in every community, in every nation and in every family, the strictest measures to preserve it from extinction and degradation.

To preserve this evolutionary heritage is to focus our attention on the long history of life's struggle on this planet. In recent centuries we have had our eyes fixed almost exclusively on the future and the potential abundance it could offer our ambitious species. Now is the time to learn to look back more often and, appreciating that past, learn humility in the face of an achievement that dwarfs all of our technology and all of our human aspirations.

Preserving this heritage means putting values other than economic values first among our priorities: the value of natural beauty, the value of respect for what we have not created and, above all, the value of life itself, a phenomenon that even Today, with all our intelligence, we can't really explain.

Learning to appreciate and preserve that legacy is the most difficult path the human species can take. I don't even know, rather I have a lot of doubts about it, if it is realistic at the point where we are, given the state of affairs in global politics, to expect most nations to be ready or willing to take it. However, I know that it is the right path, while the ambiguities, concessions and soft words of sustainable development can lead us into a quagmire.

Grades:

1. Quoted in the book of the World Commission on Environment and Development, *Our Common Future*[g] (Oxford and New York: Oxford University Press, 1987), 64. See also Sandbrook, *The Conservation and Development Program for the UK: A Response to the World Conservation Strategy* (1982); *Our Common Future*: g There is a Spanish translation:[<https://es.scribd.com/doc/105305734/ONU-Informe-Brundtland-Ago-1987-Informe-de-la-Comision-Mundial-sobre-Medio-Ambiente-y-Desarrollo>][<https://es.scribd.com/doc/105305734/ONU-Informe-Brundtland-Ago-1987-Report-of-the-World-Commission-on-Environment-and-Development>]N. from t.

A Canadian Response to the Challenge of Sustainable Development (Ottawa: Harmony Foundation of Canada, 1989); and Raymond F. Dasmann, "Toward a Biosphere Consciousness," in *The Ends of the Earth: Perspectives on Modern Environmental History*, ed. Donald Worster (New York: Cambridge University Press, 1988), 281-285.

2. Robert G. Lee, "Sustained-Yield and Social Order," in *History of Sustained-Yield Forestry: A Symposium*, ed. Harold K. Steen (sl: Forest History Society, 1984), 9495.

See also Heinrich Rübner, "Sustained-Yield Forestry in Europe and Its Crisis During the Era of Nazi Dictatorship", *ibid.*, 170 -175; and Claus Wiebecke and W. Peters, "Aspects of Sustained-Yield History: Forest Sustention as the Principle of Forestry-Idea and Reality," *ibid.*, 176-183.

3. Bernard E. Fernow, *Economics of Forestry* (New York: TY Crowell, 1902), 20.

4. I have found two books by Michael Redclift that may be useful in this case: *Development and the Environment Crisis: Red or Green Alternatives?* (London: Methuen, 1984); and *Sustainable Development: Exploring the*

Contradictions (London: Methuen, 1987). See also Sharachchandra M. L'el'e, "Sustainable Development: A Critical Review", *World Development*, 19 (June 1991), 607-621.

5. Clem Tisdell, "Sustainable Development: Differing Perspectives of Ecologists and Economists, and Relevance to LDC's", *World Development*, 16 (March 1988), 373384.

6. Arthur A. Goldsmith and Derick W. Brinkerhoff define sustainability as a condition in which "the products[h][of an institution] are sufficiently valued so that the contributions[539]¹³ continue". See his book, *Institutional Sustainability in Agriculture and Rural Development: A Global Perspective* (New York: Praeger, 1990), 13-14.

7. Wes Jackson, Wendell Berry, and Bruce Colman, eds., *Meeting the Expectations of the Land: Essays in Sustainable Agriculture and Stewardship* (San Francisco: North Point Press, 1984), x.

8. An example of how these old ecological theories still influence advocates of sustainable development is P. Bartelmus, *Environment and Development* (London: Alen and Unwin, 1986), 44.

9. Daniel B. Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (New York: Oxford University Press, 1990)[j], 10 and 62.

10. *Ibid.*, 62.

11. *Ibid.*, 6, 183, 189 and 193.

12. See also Arthur McEvoy, *The Fisherman's Problem: Ecology and Law in California Fisheries, 1850-1980* (New York: Cambridge University Press, 1986), 6-7, 10 and 150-151.

13. Botkin, *Discordant Harmonies*, 190.

¹³ "Inputs" in the original. *N. from t.*

The ecology of order and chaos

By Donald Worster

The science of ecology has had a popular impact unknown in any other field of research. Consider the extraordinary pervasiveness of the term itself: it has appeared in both the most commonplace and the most amazing places, on fluorescent T-shirts, in corporate advertising, and on bridge abutments. The language of politics and philosophy has changed - in many countries political groups are emerging that identify themselves as "Parties for Ecology". However, who has ever proposed forming a political party whose name is "Party for Comparative Linguistics" or "Party for the Advancement of Paleontology"? On several continents we have a philosophical movement called "Deep Ecology", but nowhere has anyone put forward a movement for "Deep Entomology" or "Deep Polish Literature". Why has *ecology*, this strange little word, coined by a little-known 19th-century German scientist, acquired such powerful cultural resonance, such wide acceptance ?

Behind the persistent enthusiasm for ecology, I think, lies the hope that this science can offer much more than a big pile of data. It is supposed to offer a pathway to a kind of moral progress that we can call, for the sake of simplicity, "preservation." The expectation did not originate in the public, but first appeared among eminent scientists in the field. For example, in his 1935 book, *Deserts on the March*, prominent botanist at the University of Oklahoma and later Yale, Paul Sears urged Americans to take ecology seriously, promote it in their universities and make it part of government processes. "In Britain," he noted, ecologists are being consulted at every step of planning for the proper utilization of the parts of the Empire that have not yet been colonized, thereby ending ... the era of unbridled exploitation. There are hopeful, if all too few, signs that our own national government has realized the role that ecology must play in ongoing planning.¹

Sears recommended that the United States retain the services of a few ecologists in each of its counties to advise citizens on land use issues and thus stop environmental degradation; such brigades, he thought, would make the entire nation biologically and economically sustainable.

In a 1947 addendum to that book, Sears added that ecologists, acting in the public interest, would infuse into the American mind that "field of knowledge," that "point of view, which peculiarly encompasses all that is meant by conservation." [two] In other

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

words, in the 1930s and 1940s, ecology was being welcomed as a much-needed guide to a future that would be inspired by an ethic of conservation. And conservation for Sears meant restoring biological order, maintaining the health of the earth and, consequently, the well-being of the nation,

[a] Translation by Último Reducto from “The Ecology of Order and Chaos”, chapter 13 of *The Wealth of Nature: Environmental History and the Ecological Imagination*, Oxford University Press, 1993. Copyright © 1993 Donald Worster. *N. of t.* seeking a lasting balance with nature, both through moral and technical means.

While we haven’t heeded all of Sears’ suggestions - we haven’t yet put any ecologists on county payrolls, with an office next to the tax collector’s and *sheriff’s* - we’ve walked a surprisingly long way in the direction indicated by him. Every day, somewhere in the nation, an ecologist is at work writing an environmental impact report, tracking a human-caused environmental disturbance, or testifying in court.

Twelve years ago, I published the history, going back to the eighteenth century, of this scientific discipline and its ideas about nature.² Taken as a whole, the conclusions of that book still seem sensible and valid to me: that this science has come to have in modern times an important influence on our perception of nature; that his ideas, on the other hand, have been both a reflection of ourselves and objective perceptions of nature; that scientific analysis cannot take the place of moral reasoning; that science, including the science of ecology, promotes, at least in some of its manifestations, some of our darkest ambitions toward nature and therefore itself needs moral scrutiny and critique from time to time. Ecology, I argued, should never be taken as an all-knowing and always trustworthy guide. We must be willing to challenge its authority, and indeed to question the authority of science in general; not rush to belittle, vilify or guillotine it, but simply, from time to time, to question it.

Since my book was published, a considerable amount of new ideas and new research in ecology has accumulated. I intend to examine some of these recent ideas, contrasting them with their predecessors, and asking some of the same questions that I have asked before. Part of my argument will be that Paul Sears would be surprised, and perhaps dismayed, to hear the kind of advice that environmental experts tend to give these days. They offer less and less what he would consider a program of moral progress: of “conservation” in the sense of restoring a balance between human beings and nature. If they even promise to offer it

There is a clear reason for this, I would say, and it has to do with the drastic changes in the ideas that ecologists hold about the structure and function of the natural world. In Sears’s day, ecology was basically a study of balance, harmony, and order; It had been that way since its inception. Today, however, in many scientific research circles,

² Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

it has become a study of disturbance, disharmony, and chaos, and, coincidentally or not, conservation is often not even a concern. remote.

At the same time that *Deserts on the March* was published and also when its second edition appeared, and even when its third appeared, the name that sounded the most in the field of American ecology was that of Frederic L. Clements, who, more than any other individual, introduced scientific ecology into our national academic life. He called his approach "dynamic ecology", implying that his main objects of study were change and evolution in the landscape. Clements's ecology itself focused on the process of vegetation succession - the sequence of plant communities that appear on a recently created or disturbed plot of land, beginning with the first pioneer communities that invade and settle on it. ³ Here is how I have defined the essence of the Clementsian paradigm:

One change follows another' is the inevitable principle of Clements's science. Yet he stubbornly and vigorously insisted on the notion that the natural landscape must eventually reach a vaguely final state of climax. The course of nature, he asserted, is not an aimless wandering to and fro, but a continual flux toward stability that can be exactly described by the scientist.⁴

Most interesting of all, Clements referred to that climax state as a "superorganism," implying that the plants as a whole had achieved the same tight integration of parts, the same ability to self-organize, that they possess a single organism. animal or plant In some peculiar sense, it had become a living and coherent being, not a mere atomistic collection of individuals, and it exercised some control over the non-living world around it, as organisms do.

Until well after World War II, Clements' climax theory dominated ecological thinking in this country.⁵ Take any textbook on the subject written forty or even thirty years ago[b] and you will probably find mentions of the climax. This was the theory that Paul Sears had studied and taken as the fundamental lesson of ecology that his county ecologists should teach their fellow citizens: that nature tends to a state of climax and that, as far as possible, they should learn to respect and preserve it. Sears wrote that the main job of the scientist should be to show "the imbalance that man has wrought on this continent" and to lead people back to something approximating the original health and stability of nature.⁶

³ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁴ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁵ A couple of examples:

⁶ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation

Then, however, in the early 1940s, while Clements and his ideas were still thriving, a few scientists were beginning to try to speak a new language. Expressions such as "energy flow", "trophic levels" and "ecosystem" appeared in leading publications and indicated a way of seeing nature modeled more by physics than by botany. Within a decade or two, nature came to be widely seen as a flow of energy and nutrients through a physical or thermodynamic system. Among the early prominent figures in shaping this new way of looking at things were C. Juday, Raymond Lindeman, and G. Evelyn Hutchinson. However, perhaps the most influential exponent was Eugene P. Odum who, from North Carolina and Georgia, discovered the animating and pulsating force of the sun, the global flow of energy, in his southern marshes, estuaries and abandoned cotton fields. In 1953, Odum published the first edition of his famous textbook, *The Fundamentals of Ecology*⁷. In 1966 he was named president of the Ecological Society of America.

By this time, anyone in the United States who regularly read newspapers or magazines knew at least a few of Odum's ideas, beginning with the main idea of an ecosystem, since they constitute the main themes of our popular understanding of ecology. Odum defined an ecosystem as "any unit that includes all the organisms (i.e., the 'community') in a given area interacting with the physical environment in such a way as to produce a flow of energy leading to a trophic structure, a diversity biotic and cycles of matter (that is, the exchange of matter between living and non-living parts) clearly defined within the system"⁸. The earth as a whole, he pointed out, is organized into a series of such interrelated "ecosystems," varying in size from a small pond to as vast as the Brazilian rainforest.

[b] Remember that the original text was published in 1993

period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

⁷ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁸ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

What all these ecosystems have in common is a "development strategy", a kind of operating plan that makes nature follow a general direction. This strategy is, in the words of Odum, "aimed at achieving an organic structure as large and diverse as possible within the limits imposed by the available energy inputs and by the prevailing physical conditions of its existence"⁹. Every particular ecosystem, he believed, is either moving toward that goal or has already achieved it. It is a clear, coherent and easily observable strategy; and ends happily in a state of order.

Nature's strategy, Odum added, ultimately leads to a world of mutualism and cooperation among the organisms that inhabit an area. From an initial state of competition with each other, they evolve towards a more symbiotic relationship. They learn, so to speak, to work together to control the environment around them, making it more and more suitable as a habitat, until eventually they have the ability to protect themselves from the stressful cycles of drought and flood, winter and summer, cold and heat. Odum called this state "homeostasis." To achieve this, the living components of an ecosystem must develop a structure of interrelation and cooperation that can, to some extent, manage the physical world - manage it for maximum efficiency and mutual benefit.

I have described this set of ideas as a break with the past, but this is misleading. Odum may have used different terms from Clements, may even have had a radically different view of nature at times; however, he did not reject Clements's notion that nature moves toward order and harmony. Instead of the "climax" state theory, he spoke of the "mature ecosystem" theory. Its nature may have been more like an automated factory than a Clementsian superorganism, but like its predecessor, it tended toward order.

Ecosystem theory presented a very clear set of criteria about what order and disorder consisted of, which Odum formulated as a "tabular model of ecological succession". When the ecosystem reaches its final point of homeostasis, your table shows that it spends less energy to increase production and more to develop protection against external vicissitudes: that is, the biomass of an area reaches a stable state, neither increasing nor decreasing, and the system emphasizes keeping it that way - or keeping a kind of economy without growth. Then, the small, aggressive, invasive organisms that are common in early development (species with selection strategy r) give way to larger, more stable creatures (species with selection strategy K) that may have less potential for rapid growth and explosive reproduction but instead are better able to

⁹ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

survive higher densities and maintain the locus in a stable state.¹⁰ At this point it is assumed that there is more diversity in the community - that is, a greater number of species. And that there is less loss of nutrients to the outside; nitrogen, phosphorus, and calcium remain in circulation within the ecosystem rather than escaping out of it. These are some of the indicators of ecological order, all of which are capable of being accurately measured. One clear implication was that if you interfere too much with nature's development strategy, you can pay for yourself: the effects will include severe nutrient loss, decreased species diversity, an end to biomass stability. In short, the ecosystem will be damaged.

The most probable cause of said damage was not a mystery to Odum: it was human beings trying to increase the production of useful materials and foolishly risking the destruction of their own life support system:

Man has generally been concerned with obtaining as much "production" from the environment as possible, through the development and maintenance of ecosystem types typical of early stages of succession, usually monocultures. However, of course, man does not live only on food and vegetable fibers; it also needs an atmosphere with a balance between CO₂ and O₂, the climate buffer offered by the oceans and masses of vegetation and clean (ie unproductive) water for cultural and industrial uses. The landscapes that best provide man with the essential resources for the cycle of life, not to mention recreational and aesthetic needs, are the least "productive". In other words, the landscape is not only a store of supplies, it is also the *oikos* - the home - in which we must live.[808]

Odum's view of nature as a series of ecosystems in a balance, already achieved or in the process of being created, led him to take a strongly favorable stance on preserving the environment in as close to a natural state as possible. It suggested the need for a substantial restriction of human activities - for environmental planning "on a rational and scientific basis". For him, as for Paul Sears, ecology should be instilled in the public and constitute the foundation of education, economics and politics; America and other countries should be "greened."

Of course, not everyone who took an ecosystem-based approach to ecology came to the same conclusions as Odum. Rather the opposite, many found in the idea of ecosystem a wonderful instrument to promote global technocracy. In some circles it was hoped that experts trained in manipulating ecosystems could eventually manage the planet as a whole to improve efficiency. "Ruling" all of nature with the help of rational science was the dream of those ecosystem technocrats.[809] But I believe that technocratic management was not the main lesson that the public drew from Professor Odum's classes; many came away as ardent advocates, like him, of preserving large chunks of wilderness in an unmanaged state and convinced that they had been given

¹⁰ For example: "*In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*" (*Earth's Revenge*, page 166).

a solid scientific foundation and knowledge base to carry out such preservation. We must defend the world's endangered ecosystems, they insisted. We have to safeguard the integrity of the Greater Yellowstone Ecosystem[c], the Chesapeake Bay ecosystem, the Serengeti ecosystem. We have to protect the diversity of species, the stability of the biomass and the calcium cycle. We must make the world safe for K species.[810]

This was the motto of ecologists and environmentalists alike in the 1960s and early 1970s, when it seemed that the next big battle would be between what remained of pristine nature, delicately balanced in the beautifully rational ecosystems of Odum, and a human race dedicated to senseless and greedy destruction. A decade or two later the situation has changed considerably. Environmental threats are still around us, certainly, and they are more dangerous than ever. Newspapers tell us about ongoing disasters like the 1989 Prince William Bay oil spill in Alaska, and reporters insist on using words like "ecosystem," "balance," and "fragility" when describing such disasters. So do many scientists, who continue to acknowledge their theoretical debt to Odum. For example, in a recent British survey, 447 out of a total of 645 ecologists surveyed considered the "ecosystem" as one of the most important concepts that their discipline has contributed to our understanding of the natural world; in fact, "ecosystem" appeared at the top of their list, obtaining more votes than nineteen other fundamental concepts.¹¹ However, it does not matter, despite the persistence of environmental problems, the Odum ecosystem is no longer the main topic in the research or teaching of that science. A review of recent ecology textbooks shows that the concept is not even mentioned in one of the main works and occupies a very small place in the rest.¹²

Ecology is no longer what it was. Lately a rather drastic change has been taking place in this science: a radical departure from the thinking of Eugene Odum's generation, from its assumptions of order and predictability; a move away towards what we could call a new *ecology of chaos*.

In July 1973, the *Journal of the Arnold Arboretum* published an article written by two scientists associated with the Massachusetts Audubon Society, William Drury and Ian Nisbet, which questioned the foundations of the ecology of Odum. The title of the article was simply "Succession"[d], referring to the old issue of observed sequences in plant and faunal associations. Both Frederic Clements and Eugene Odum viewed succession as a direct and narrow path to balance. Drury and Nisbet did not agree with this assumption at all. His observations, made specifically in the temperate forests of the northeastern United States, strongly suggested that the process of ecological succession was leading nowhere. The change occurs without any determinable direction and continues to occur forever, without reaching a point of stability. They found

¹¹ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹² By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

no evidence of progressive development in nature: no progressive increase in biomass stability over time, no progressive diversification of species, no progressive movement towards greater cohesion in plant and animal communities, nor towards greater success in regulating their environment. In fact, they found none of the criteria that Odum had proposed for mature ecosystems. The forest, they insisted, no matter its age, is nothing more than an erratic and changing mosaic of trees and other plants. In his own words, “most succession phenomena should be understood as the result of differential growth, differential survival, and perhaps differential dispersal of species adapted to grow at different points within a stress gradient” .¹³ In other words, they could see many individual species, each doing its own thing, but they could not locate any emerging collectivity, nor any strategy to achieve it.

Among the authorities cited by them in support of their view was the almost forgotten name of Henry A. Gleason, a taxonomist who, in 1926, had called into question Frederic Clements and his organic theory of climax in an article entitled “The Individualistic Concept of the Plant Association”[e]. Gleason had argued that we live in a world of constant flux and impermanence, not Clements’ climactic world. There is no such thing as stability, equilibrium, or steady state. Each of the plant associations is nothing more than a meeting

[d] “Succession”. *N of the t.*

[e] “The individualist concept of plant association”. temporary *n of t.* of strangers, a grouping of unrelated species, here today for a short time, tomorrow on their way elsewhere. “Each ... plant species is a law unto itself,” he wrote.¹⁴ We look for cooperation in nature and find only competition. We searched all organized and we only managed to discover loose atoms and fragments. We hope to find order and only discern a jumble of species that happen to be in the same place, all seeking their own benefit with absolutely no concern for the others.

Thanks in part to Drury and Nisbet, this “individualistic” notion experienced a revival in the mid-1970s and, by the start of the current decade[f], had become the central idea of what some scientists hailed as a revolutionary new paradigm in ecology. To promote it, they attacked the traditional notion of succession; for to reject that notion was to reject the larger idea that organic nature tends to order. In 1977, two other biologists, Joseph Connell and Ralph Slatyer, continued the attack, denying the old claim that an invasive community of pioneer species, the first stage in the Clements

¹³ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*]< em>, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁴ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

sequence, works to pave the way for their successors, like a group of Danieles Boon opening the way to civilization. The first to arrive, Connell and Slatyer argued, manage in most cases to mark their territory and successfully defend it; they do not give way to a later and superior group of colonizers. Only when the pioneers die or are damaged by natural disturbances, thus freeing the resources they have monopolized, can the newcomers find a niche and establish themselves.

As this assault on old thinking gathered momentum, the word "perturbation" began to appear more frequently in the scientific literature and to be taken much more seriously. "Disturbance" was not a common theme in Odum's time, and was almost never used in combination with the adjective "natural." Now, however, it was as if scientists were out there tirelessly searching for signs of disturbance in nature - especially signs of disturbance not caused by humans - and they were finding them everywhere. By the beginning of the present decade[g] these new ecologists had succeeded in leaving little tranquility left in primitive nature. Fires are one of the most common disturbances they noted. Also the wind, especially if it is in the form of violent hurricanes and tornadoes. As well as invasive populations of microorganisms, pests and predators. And volcanic eruptions. And the invasive ice masses of the Quaternary Period. And devastating droughts, like the one in the 1930s in the western United States. It is above all these last types of disturbances caused by the agitation of the climate, on which the new generations of ecologists have emphasized. As one of the most influential among them, Professor Margaret Davis of the University of Minnesota, has written: "During the last 50 or 500 or 1,000 years - or any length of time that one might consider 'ecological time' - there has never been a interval in which the temperature is maintained in a steady state with symmetric fluctuations around a mean. only on the longest time scale, 100,000 years, is there a tendency for cyclical variation; and the cycles are asymmetric, with an average very different from the current one".¹⁵

One of the most provocative and impressive expressions of the new post-Odum ecology is a book edited by STA Pickett and PS White, *The Ecology of*

[f] Remember that the original text was published in 1993. T.N. [g] *Idem. N of the t.*

Natural Disturbance and Patch Dynamics (published 1985). I present it as symptomatic of much current thinking in this field. Although the last section of the book is actually about ecosystems, this term has lost much of its original meaning and implications. In fact, two of the authors begin their contribution with the complaint that many scientists assume that "homogeneous ecosystems are a reality", when the truth is that "virtually all ecosystems of natural origin and disturbed by man are mosaics of conditions environmental". "Historically," they write, "ecologists have been slow to recognize the importance of disturbances and the heterogeneity they generate." The reason for

¹⁵ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

such slowness? “Most work, both theoretical and empirical, has been dominated by the equilibrium perspective.”¹⁶ Rejecting this perspective, these authors take us to the tropical forests of South and Central America and the Florida Everglades, showing us instability on all sides: a wet and green world of continuous alteration -or as they prefer to say, “of disturbances”. Even the prairies of North America, which inspired Frederic Clements’ climax theory, appear in this collection as regularly disturbed environments. Another chapter describes them as a “fine-textured dynamic mosaic” that is constantly kept in a state of agitation by the work of badgers, pocket rats[h], and mound-building ants, along with fire, drought, and erosion due to to wind and water.¹⁷ The message in all these writings is consistent: the notion of climax is dead, that of ecosystem has lost its usefulness and in its place we have the idea of modest “patches”. Nature should be considered as a landscape of patches, large and small, patches of all textures and colors, a patchwork blanket of living things, constantly changing through time and space, responding to a barrage of disturbances. The patches on that blanket never last long.

Well, it’s clear that scientists have long known about pocket rats, winds, Ice Ages and droughts. Until now, however, they had not allowed such perturbations to spoil their theories about balanced plant and faunal assemblages, and we must ask why this has been the case. Why did Clements and Odum tend to disregard forces such as climate change, at least of the less catastrophic kind, as not threats to the order of nature? Why, instead, have their successors tended to put so much emphasis on these changes, to the point that they often see nothing but instability in the environment?

One clue is given by the fact that many of these disturbance advocates are not and have never been ecosystem scientists; they received their training in the branch of population biology and reflect the growing confidence, methodological maturity, and influence of that branch.¹⁸ When looking at a forest, population ecologists only see the trees: they see them and count them—so many pines, so many false fir[i], so many maples, and so many birch trees. They insist that if we know all there is to know about the individual species that make up a forest, and can accurately and quantitatively measure their lives, we will know all there is to know about that forest. It does not possess the characteristic properties of an organism or “emergent”. It is not a whole greater than the sum of its parts that requires a “holistic” understanding. Equipped with computers that can trace the life histories of individual species and record the ups

¹⁶ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

¹⁷ “Red pine” in the original. American Red Pine, *Pinus resinosa*. N. from trans.

¹⁸ Page 114.

and downs of populations, they have brought a level of [811] mathematical precision to ecology that is impressive. And what they see when they look at the histories of any patch of terrain are wild wobbles. Rising populations and plummeting populations, such as stock prices, car sales, and skirt lengths. We live, they insist, in a world without balance.¹⁹

There is another reason for the paradigm shift I have been describing, although I suggest it in a rather tentative way and can only offer vague hints of it. For some scientists, a nature characterized by strongly individualistic associations, constant disturbance, and incessant change may be more ideologically satisfying than Odum's notion of an ecosystem, which emphasizes cooperation, social organization, and environmentalism. An illustrative case is the famous popularizer of contemporary ecology, Paul Colinvaux, author of *Why Big Fierce Animals Are Rare* (1978). The chapter on succession begins with these lines: "If the planners came into power, so that they could eliminate all individual liberty and do as they pleased with our land, they could decide that all the counties that are full of small farms should be converted back to forest." It is clear that he is not an enthusiast of land use planning or forest restoration. And he ends that same chapter with these remarkably revealing and self-assured words:

Now we can ... explain, in fact, all the intriguing and predictable occurrences of sequences in simple Darwinian terms. Everything that happens in successions happens because all the different species try to find life as best they can, each in its own particular way. What the properties of a community look like is in fact the sum of the results of all these individual cases of private enterprise.²⁰

It seems, if this example is any indication, that Social Darwinists are back on the scene, and at least some of them are ecologists; and at least part of their opposition to Odum's science may have to do with their revulsion at what they perceive to be its political implications, including its appeal to environmentalists. Colinvaux is very clear about the need to mark certain distances between himself and groups like the Sierra Club[j].

I am not alone in wondering whether there might be a deeper and only half-stated ideological motive causing this new direction in ecology. The Swedish historian of science Thomas Soderqvist, in a recent study of the development of ecology in his country, concludes that evolutionary ecologists of the current generation seem to practice ecology for fun, indifferent to practical problems, including the salvation of the nation. They are mathematically and theoretically sophisticated, sitting under cover doing calculations on their computers, instead of running around scouring nature. They are individualists who abhor the idea of large-scale ecosystem projects. Indeed, the transition from ecosystem ecology to evolutionary ecology seems to mirror the generational

¹⁹ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²⁰ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

transition from the politically conscious generation of the 1960s to the "yuppie" generation of the 1980s.²¹

This may be an exaggerated characterization, and I do not mean to apply it to every scientist who has published about patch dynamics or perturbation regimes. However, he draws our attention to an unmistakable attempt by many ecologists to distance themselves from reformist environmentalism and its critiques of human impact on nature.

However, I wish the emergence of the new ecology after Odum could be explained as simply by referring only to the two previous reasons: as a triumph of reductionist population dynamics over holistic consciousness or as a triumph of social Darwinism or of business ideology on the commitment to environmental conservation. However, it seems that there is something more than that and that something is taking place in all the natural sciences - biology, astronomy, physics - and perhaps in all modern technological societies. It is nothing less than the discovery of chaos. Nature, many have come to believe, is fundamentally erratic, discontinuous, and unpredictable. It's full of seemingly random occurrences that elude our models of how things are supposed to work. As a result, the unexpected keeps hitting us in the face. The clouds gather and disperse and the rain either falls or doesn't fall, with no respect for our careful weather predictions, and we are unable to explain why. Cars suddenly back up on the highway and traffic controllers panic. A man's heart beats regularly year after year, and suddenly it starts to skip a beat now and then. A ping-pong ball bounces off the table in an unexpected direction. Every little snowflake that falls from the sky turns out to be completely different from every other flake. These are ways in which nature appears to be chaotic, according to all our previous theories and methods. If the ultimate test of the validity of scientific knowledge is its ability to predict events, then all the sciences and pseudosciences—physics, chemistry, climatology, economics, ecology—regularly fail the test. All of them have been making laws, designing models, predicting what a particular atom or person is supposed to do; and now, more and more, they are beginning to admit that the world never behaves quite the way it is supposed to.

Making sense of this situation is the task of an entirely new type of research that calls itself chaos science. Some say it is a revolution in thought equivalent to quantum mechanics or relativity. Like those other revolutions of the 20th century, chaos science rejects postulates that go back to the days of Sir Isaac Newton. In fact, what is happening may not be two or three different revolutions but a single revolution against all the principles, laws, models and applications of classical science, the science implanted by the great Scientific Revolution of the 17th century.²² For centuries we have assumed that nature, despite the existence of a few appearances to the contrary, is a perfectly

²¹ "Sweat lodge" in the original. *N. from trans.*

²² Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

predictable system with linear and rational order. Once we get the right amount of data, the scientists said, we'll be able to describe that order in great detail - we'll be able to plot the lines along which everything moves and the speed of that movement, as well as the collisions that will occur. Even Darwin's theory of evolution, which over the last century had challenged much of the Newtonian worldview, left many people's confidence that order would eventually prevail in the evolution of life intact; where the tangled history of competitive struggle would produce progress, harmony, and stability. Today that traditional assumption may have been irretrievably shattered. For whatever reason, either because the empirical data suggest it, or because extrascientific cultural trends suggest it, or because of the experience of so much rapid social change in our daily lives, scientists are beginning to turn their attention to what they had been trying to do. to avoid seeing for so long. The world is more complex than we have ever imagined, they say, and indeed, some would add, than we can ever imagine.[28]

Despite the obvious complexity of their field of research, ecologists have been among the slowest scientists to join the interdisciplinary science of chaos. I suspect that the influence of Clements and Odum, which persisted well into the 1970s, worked against the new perspective, reinforcing faith in linear regularities and equilibrium in interactions between species. Be that as it may, the day of conversion finally arrived. In 1974 Princeton mathematical ecologist Robert May published an article entitled: "Biological Populations with Nonoverlapping Generations: Stable Points, Stable Cycles, and Chaos."²³ In it he admitted that the mathematical models he and others had constructed were inadequate accounts of the patchy life histories of organisms. They did not fully explain, for example, the population explosions of hairy lizard moths²⁴ in the deciduous forests of the eastern United States or the cycles of Canada lynxes in the subarctic. Populations do not follow a simple Malthusian pattern of growth, saturation, and crash.

More and more ecologists have followed in May's footsteps and are beginning to bring their research areas in line with chaotic theory. William Schaefer is one of them; Despite being a disciple of Robert MacArthur, one of the leaders of the old school of equilibrium, he has recently been as intrigued as May and others by the same anomaly of unpredictable fluctuations in populations. Although he had been brought up to believe in "the so-called 'Equilibrium of Nature,'" he writes, "...the idea that populations are in or close to equilibrium," things are now beginning to look very different.²⁵ He describes how he has had to delve into different disciplines to establish connections with concepts of chaos in the other natural sciences, in order to free himself from the restrictive past of his own field of study.

The study of chaos began in 1961, with attempts to simulate weather and climate patterns on a computer at MIT[m]. There, meteorologist Edward Lorenz formulated his

²³ "DNR" in the original. "Department of Natural Resources". *N. from trans.*

²⁴ "Gipsy moths" in the original. *Lymantria dispar*. *N. from t.*

²⁵ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

famous “Butterfly Effect,” the notion that a butterfly stirring up the air in a Beijing park today can alter storm systems in New York City next month. Scientists call this phenomenon “initial condition dependent sensitivity.” What it means is that tiny differences in inputs can quickly turn into substantial differences in outputs. A corollary is that we cannot know, even with all our artificial intelligence devices, each and every tiny difference that has occurred or is occurring anywhere or at any time; nor can we know what substantial differences in products will be caused by each of those tiny differences. Beyond a very short period of time, say two or three days from the time they are made, our predictions are worth less than the paper they are written on.

The implications of this “Butterfly Effect” for ecology are profound. If a single flap of an insect wing in China can cause torrential rainfall in New York, what could it do to the Greater Yellowstone Ecosystem? What can ecologists ever know about all the forces that affect, or are about to affect, any piece of land? What can they safely ignore and what should they pay attention to? What even distant, invisible and minuscule events may be happening now that changes the organization of plant and animal life in our immediate surroundings? This is the problem, and the challenge, posed by the science of chaos; and it is dramatically altering the mindset of ecologists.

John Muir[n] once said, “When we try to separate a single thing, we find that it is tied up with everything else in the universe.”²⁶ For him, this was a manifestation of an infinitely wise plan in which everything worked in perfect harmony. Chaos ecology, while impressed, like Muir, by interdependence, does not share his vision of an “infinitely wise plan” that controls and orders everything. There is no plan, current scientists say; nor an evident harmony in the events of nature. If there is order in the universe - and there will be no science at all if all faith in order vanishes - it is much more difficult to locate and describe than we thought.

For Muir, the obvious lesson to be drawn from cosmic complexity was that human beings should love and preserve nature as it is. The lessons of the new ecology, by contrast, are unclear. Does it promote, in the words of Ilya Prigogine and Isabelle Stenger, “a renaissance of nature”, a less hierarchical way of looking at life and a set of “new relationships between man and nature and between men”? [32] Or does it rather increase our estrangement from the world, our withdrawal into postmodern doubt and insecurity? What is left that deserves to be loved or preserved in a universe of chaos? How are people supposed to behave in such a universe? If that’s the kind of place we inhabit, why not go ahead with all our private ambitions, free from any fear that we might be doing special harm? What does the phrase “environmental damage” mean, after all, in a world with so much chaos? Does the environmental tradition to which Muir belonged, along with so many other naturalistic writers and environmentalists of the past, people like Paul Sears, Eugene Odum, Aldo Leopold, and Rachel Carson, still make sense? I do not have space here to try to answer these questions, nor to make predictions, but only to warn that they are too important to be left to scientists

²⁶ “National forests” in the original. *N. from trans.*

to answer alone. Nowadays, ecology cannot be considered omniscient, completely wise or eternally true; no more than in the past.

Whether they turn out to be true or false, whether they are permanent or fads, it seems entirely possible that these changes in scientific thinking aimed at emphasizing chaos will not lead to a relaxation of ecological concern. Although terms like “ecosystem” or “climax” may disappear and a new vocabulary take their place, the fear of risk and danger will probably be greater than ever. Most of us are intuitively aware, whether we can formulate our fears in mathematical formulas or not, that the technological power we have amassed is *destructively* chaotic; it is not unreasonable that we fear it and that we fear what it might do to us and to the rest of nature.²⁷ We moderns, having absorbed the lessons of today’s science, may discover that we can no longer love nature as simply as Muir did; but we may also find more reason than ever to respect it - to respect its bewildering complexity, its inherent

[n] John Muir (1838-1914) was an American naturalist and writer. He was one of the fathers of the conservation movement and founder of the Sierra Club. *N. of t.* unpredictability, its daily turbulence. And to flap our own wings on it a little more gently.

Grades:

1. Paul Sears, *Deserts on the March*, 3[a] ed. (Norman: University of Oklahoma Press, 1959), 162.

2. *Ibid.*, 177.

3. Donald Worster, *Nature’s Economy: A History of Ecological Ideas* (New York: Cambridge University Press, 1977).

4. This is the particular subject of Clements’s book *Plant Succession* (Washington: Carnegie Institution, 1916).

5. Worster, *Nature’s Economy*, 210.

6. Clements’ main rival for influence in the United States was Henry Chandler Cowles of the University of Chicago, whose paper on ecological succession appeared in 1899. The best study of Cowles’ ideas is in J. Ronald Engel, *Sacred Sands: The Struggle for Community in the Indiana Dunes* (Middletown: Wesleyan University Press, 1983), 137-159. Engel describes him as someone with a less deterministic and more pluralistic notion of succession, someone who “opened the way to a more creative role for human beings in nature’s evolutionary adventure” (150). See also Ronald C. Tobey, *Saving the*

²⁷ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

Prairies: The Life Cycle of the Founding School of American Plant Ecology, 1895-1955 (Berkeley: University of California, 1981).

7. Sears, *Deserts on March*, 142.

8. This book was co-written with his brother, Howard T. Odum, and two more editions were published, the last one appearing in 1971.

9. Eugene P. Odum, *Fundamentals of Ecology*[o] (Philadelphia: WB Saunders, 1971), 8.

10. Odum, "The Strategy of Ecosystem Development"[p], *Science*, 164 (April 18, 1969), 266.

11. The terms "K selection" and "r selection" are from Robert MacArthur and Edward E. Wilson's book, *Theory of Island Biogeography* (Princeton: Princeton University Press, 1967). During the 1950s and 1960s, together with Odum, MacArthur was the main spokesperson for the notion of nature understood as a series of thermodynamically balanced ecosystems.

12. Odum, "The Strategy of Ecosystem Development", 266. See also Odum, "Trends Expected in Stressed Ecosystems", *BioScience*, 35 (July/August 1985), 419-422.

13. A book by that title was published by Earl F. Murphy: *Governing Nature* (Chicago: Quadrangle Books, 1967). From time to time, Eugene Odum himself o There is a Spanish edition: *Fundamentals of ecology*, Thomson Learning, 2006. *N. del t. p* There is an edition in Spanish: "The ecosystem development strategy"

[https://drive.google.com/file/d/1sOcPRdS_fHSb2sQlhSSKInNrzl5DExni/view][(https://drive.google.com/file/d/1sOcPRdS_fHSb2sQlhSSKInNrzl5DExni/view)]. *N.* seems to have embraced or supported that ambition, and it is certainly central to the work of his brother Howard T. Odum. On this subject see Peter J. Taylor, "Technocratic Optimism, HT Odum, and the Partial Transformation of Ecological Metaphor after World War II", *Journal of the History of Biology*, 21 (Summer 1988), 213 -244.

14. A highly influential popularizing work on Odum's notion of nature is Barry Commoner's book *The Closing Circle: Nature, Man, and Technology*[q] (New York: Knopf, 1971). See specifically the commentary on the four "laws" of ecology (33-46).

15. Malcolm Cherrett Communication, *Ecology*, 70 (March 1989), 41-42.

16. See Michael Begon, John L. Harper, and Colin R. Townsend, *Ecology: Individuals, Populations, and Communities*[r] (Sunderland, Massachusetts: Sinauer, 1986). Odum's ideas are critically presented as belonging to the traditional approach in another textbook: RJ Putnam and SD Wratten, *Principles of Ecology* (Berkeley: University of California Press, 1984). More faithful to the ecosystem model are Paul Erlich and Jonathan Roughgarden's *The Science of Ecology* (New York: Macmillan, 1987) and Robert Leo Smith's *Elements of Ecology*< /em>, 2[a] ed. (New York: Harper & Row, 1986), although the latter admits that he has moved from the "ecosystem-based approach" to a " more evolutionary approach."

17. William H. Drury and Ian CT Nisbet, "Succession," *Journal of the Arnold Arboretum*, 54 (July 1973), 360.

18. HA Gleason, "The Individualist Concept of the Plant Association," *Bulletin of the Torrey Botanical Club*, 53 (1926), 92-110.

19. Joseph H. Connell and Ralph O. Slayter, "Mechanisms of Succession in Natural Communities and Their Role in Community Stability and Organization," *The American Naturalist*, 111 (November-December 1977), 1119- 1144.

20. Margaret Bryan Davis, "Climatic Instability, Time Lags, and Community Disequilibrium," in *Community Ecology*, Jared Diamond and Ted J. Case, eds. (New York: Harper & Row, 1986), 269.

21. James R. Karr and Kathryn E. Freemark, "Disturbance and Vertebrates: An Integrative Perspective," *The Ecology of Natural Disturbance and Patch Dynamics*, eds. STA Pickett and PS White (Orlando, Florida: Academic Press, 1985), 154-155. Anyway, the Odum school of thought is not quiet at all. Another recent collection has been collected in his honor, and many of its authors say they have continued to support his ideas: LR Pomeroy and JJ Alberts, eds., *Concepts of Ecosystemic Ecology: A Comparative View* (New York: SpringerVerlag , 1988).

22. Orie L. Loucks, Mary L. Plumb-Mentjes, and Deborah Rogers, "Gap Processes and Large-Scale Disturbances in Sand Prairies," in Pomeroy and Alberts, *ibid.*, 72-85.

23. For the rise of population biology see Sharon E. Kingsland, *Modeling Nature: Episodes in the History of Population Biology* (Chicago: University of Chicago Press, 1985).

[q] There is an edition in Spanish: *The circle that closes*, Plaza & Janés SA Editores, 1973. *N. from t.*

[r] There is an edition in Spanish: *Ecology: individuals, populations and communities*, Omega, 1999. *N. from t.*

24. An influential exception to this trend is FH Bormann and GE Likens's book, *Pattern and Process in a Forested Ecosystem* (New York: SpringerVerlag, 1979), which proposes (in chapter 6) the model of a "changing mosaic steady state". See also P. Yodzis, "The Stability of Real Ecosystems," *Nature*, 289 (February 19, 1981), 674-676.

25. Paul Colinvaux, *Why Big Fierce Animals Are Rare: An Ecologist's Perspective*²⁸ (Princeton: Princeton University Press, 1978), 117 and 135.

26. Thomas Soderqvist, *The Ecologists: From Merry Naturalists to Saviors of the Nation. A Sociologically Informed Narrative Survey of the Ecologization of Sweden, 1895-1975* (Stockholm: Almqvist & Wiksell International, 1986), 281.

27. This argument is defended with great intellectual force by Ilya Prigogine and Isabelle Stengers in, *Order Out of Chaos: Man's New Dialogue with Nature* (Boulder: Shambala/New Science Library, 1984). Prigogine won the Nobel Prize in 1977 for his work on the thermodynamics of unbalanced systems.

28. An excellent account of the shift in thinking is James Gleick's book, *Chaos: The Making of a New Science*[t] (New York: Viking, 1987). Here I have relied heavily on his explanation. What Gleick does not explore are the striking parallels between

²⁸ There is an edition in Spanish: *Why are wild beasts scarce*, Orbis, 1987. *N. from t.*

chaos theory in science and postmodern discourse in literature and philosophy. Postmodernism is a mindset that has abandoned the historical quest for unity and order in nature, taking an ironic view of existence and refuting all established faith. According to Todd Gitlin, "Postmodernism reflects the fact that a new moral structure has not yet been built and that our culture has not yet found a language to articulate the new understandings with which we are hesitantly trying to live together. . He objects to every principle, to every devotion, to every crusade - in the name of an unconscious evasion. On the other hand, and more positively, the new sensibility leads to a new emphasis on democratic coexistence: "a new 'moral ecology' - that a condition for the preservation of the self is the preservation of the other". T. Gitlin, "Post-Modernism: The Stenography of Surfaces," *New Perspectives Quarterly*, 6 (Spring 1989), 57-59. See also N. Catherine Hayles, *Chaos Bound: Orderly Disorder in Contemporary Literature and Science* (Ithaca: Cornell University Press, 1990), especially chapter 7.

29. The article was published in *Science*, 186 (1974), 645-647. See also Robert M. May, "Simple Mathematical Models with Very Complicated Dynamics," *Nature*, 261 (1976), 459-567. Gleick comments on May's work on pages 89-90 of *Chaos*.

30. WM Schaeffer, "Chaos in Ecology and Epidemiology," in *Chaos in Biological Systems*, eds., H. Degan, AV Holden, and LF Oldsen (New York: Plenum Press, 1987), 233. See also Schaeffer, "Order and Chaos in Ecological Systems," *Ecology*, 66 (February 1985), 93-106.

31. John Muir, *My First Summer in the Sierra* (1911; Boston: Houghton Mifflin, 1944), 157.

32. Prigogine and Stengers, *Order Out of Chaos*, 312-313.

33. Much of the alarm that Sears and Odum, among others, expressed has been transformed into a global perspective and the baton of old equilibrium thinking has been picked up by scientists concerned with the geochemical and biochemical state of the planet taken as a whole and about human threats to its stability, especially the burning of fossil fuels. One of the most influential texts on this new development is James Lovelock's book *Gaia: A New Look at Life on Earth*[u] (Oxford: Oxford University Press, 1979). See also Edward Goldsmith, "Gaia: Some Implications for Theoretical Ecology," *The Ecologist*, 18, n[a] 2/3 (1988): 64-74.

There is an edition in Spanish: *Gaia: a new vision of life on earth*, Unigraf, 1983. *N. from t.*

Restoring the natural order

*By Donald Worster*¹

A few years ago I was driving down a country road in Wisconsin looking for the place where a man had died. The highway had once been the path of pioneers moving west, then a country road through dry, sandy, marginal fields. In the Prohibition days he had carried the locally distilled moonshine; some of the last trees had been felled to cook the contraband malt. Then, in 1935, a settler of a different type came. It was the time of the Great Depression, and he was able to buy a lot of land cheaply by paying back taxes on land abandoned by its owners, 120 acres² in all. That land no longer had any economic value left. That man, whose name was Aldo Leopold, knew it but didn't care; he was not seeking profit, not even subsistence. He began coming regularly to plant trees from the city of Madison, where he taught at the university. For thirteen years he planted and cared for them. Then, in 1948, he died fighting a forest fire on a neighbor's land. Knowing these few details, I went looking to find out what kind of man he was and what he gave his life for.

There was no advertising, no tour guide offered, but the dense pine forest was advertisement enough that Leopold's place was here, all of it now restored to its natural splendor. I walked through an open field rich in grasses and wild herbs to a small, gray, dilapidated cabin where he had stayed for those weekends, enjoying the scent of his new pine trees growing and the sound of birdsong and the wind in its branches. From the cabin, I walked down a short path to the Wisconsin River, which ran silently between its jagged banks, the hot summer sun glinting off its ripples. One August years ago Leopold, as he recalls in a sketch he wrote and included in *A Sand County Almanac*³, discovered that the river had a "painter's mood", unfolding a brief carpet of moss on its slimy edges, adorning it brilliantly with blue, white, and pink flowers, attracting deer and field mice, and then abruptly rubbing its palette on the stark sand. For me, this painting is long gone, but not the memory of it, which has been lingering captured in the words of the man who saw it and who, in its presence, must have stood breathless for a few moments. I was intensely convinced that he had nature on his side. He realized that the land could recover from the degradation suffered. She had an inexhaustible

¹ Translation by Último Reducto of "Restoring a Natural Order", Chapter 14 of *The Wealth of Nature: Environmental History and the Ecological Imagination*, Oxford University Press, 1993. Copyright © 1993 Donald Worster. *N. from t.*

² 1 acre is approximately 0.4 hectares. *N. from t.*

³ There is an edition in Spanish: "An almanac of the sandy county" in *An ethics of the Earth*, Los Libros de la Catarata, 2000. (See review in *Naturaleza Indómita*.)

ability to create harmony and grace from ordinary and worthless materials, even slime, tiny spores, and heron tracks along a sandbank. And no matter how abused it had been throughout its history, it could regenerate itself. In the 1930s, a time of national despair caused by severe economic and ecological collapse, discovering that fact must have been reassuring.

Today, it is still something necessary. And Leopold's home is where the world can come to test these natural regeneration processes, aided by human commitment and intelligence. There is, after all, a way back to the Garden.

I am a growing admirer of Leopold's wisdom, and while I am aware of the need for collective effort, I find the most hopeful message in his intensely private and unflappable dedication to achieving a humble dream. He did not leave the task of restoration in the hands of someone with more money, authority, or free time. Despite being a very busy professional, an active researcher and teacher, with another home and family to care for in the city, he put his own shovel and back to work in rehabilitating this piece of land.

Leopold never seems to have had the notion that what he was doing on those logged and depleted acres was making an investment for himself and others, that one day the property would once again be valuable to the lumber or market. playtime. Although trained in the modern school of natural resource management - he was a game management specialist in his other life - he was not here to "manage" wildlife, forests or water, at least not as marketable commodities to manipulate for our own instrumental ends. What brought him here on weekends was first a desire to get to know the place intimately, and then to apply his knowledge and love to heal it. He came as some kind of doctor, a "country doctor" we might say, who had found a sick and neglected patient who might need his care. Accepting the moral responsibility of caring for the patient, he refused all remuneration except the satisfaction he could derive simply by watching the progress of recovery.

We could also say in other words, although we come to the same conclusion, that he came as an artist and, finding a damaged work of art, felt the impulse to restore it to its glory. For him health was beauty and beauty was health. Leopold had the kind of aesthetic temperament that seeks not to discover an outlet for his own subjective impulses, but to discover what is wonderful in the world, be it latent or evident, and to become its admirer and caretaker, accepting that beauty has an objective existence outside oneself, that beauty is a quality that can be discovered as well as invented. None of those who had occupied Leopold's ground before him had paid much attention to its aesthetic qualities; perhaps, given the pressures of survival, they couldn't. They only saw what was on the surface. "The incredibly intricate plant and animal communities," he wrote, "the intrinsic beauty of the organism called America," had disappeared under the heavy footprint of colonization without much reflection or insight.

What draws visitors like me to Leopold's wild and flourishing garden today is a shared belief that the world of nature constitutes a model of order that we are obliged to respect and care for; and perhaps even risk our lives to save it.

I do not know where the idea of such an order originated. It has probably been there, in the human mind, all along, like the ability to count, to do things, and to raise children. Certainly, the oldest cultures, pagan and animistic, had a strong and lively notion of it. Likewise, although with varying degrees of devotion, modern religious traditions such as Judaism, Christianity, Taoism and Hinduism have had it. Christians, for example, sometimes speak enthusiastically of "Creation," having in mind some orderly arrangement of natural things that is both rational and beyond comprehension. Their harmony is functional, but not narrowly utilitarian for them. It requires that they admire it, as well as that they use it. The Christians, along with the Jews, further insist that there must be someone who created that beauty out of the void and who keeps it constantly intact throughout time and space. The heavens declare the glory of God, they say reciting the Psalms, and the earth shows his work. Certainly, however, the power imagined as an explanation came later, first it was the awareness of the beauty of the world. The Taoists of China, by contrast, believed that the order of nature was not created by any external force, but was inherent in nature itself - that there is a Way, that all things move harmoniously together along of it and that each one does it following their own impulse. Regardless of these differences in concept, all those religions agree that since there is stunning beauty in the world, there is some obligation on human beings to respect it. Although we did not design or organize this order, we are able to be, and therefore we are obliged to be, its custodians and guardians. This is one of the fundamental truths that men and women of various faiths have defended as self-evident.

I grew up believing that religion had a permanent enemy in science, that the victory of one of the two must mean the defeat of the other. And it seems clear that, in modern times, religion has lost much ground as a source of authority to science. Yet it is amazing to note that, whatever its competitive effect on any particular creed, science itself originally grew out of an awareness of natural beauty that was very similar to that which existed in religion. Drop the assumption that the world is an ordered whole whose parts all work together to achieve self-regulating stability, that there is an arrangement and coherence to things that can be understood, and science will cease to exist. I see now that science, and all its branches, had to start with some kind of holistic ideal. It is a fundamental assumption. And quite possibly, like its analog, religion, science cannot definitively prove that assumption by appealing to facts or texts, but, on the contrary, such an assumption derives from some deeper perceptual process - from an intuition that arises in almost everyone who lives in a close and attentive relationship with nature. Scientists do it frequently; It is not surprising, therefore, that many of them speak with admiration and delight about the exquisite order they discover in the world.

Beginning with Charles Darwin and his theory of evolution, ecologists have insisted that nature should not be understood as a fixed and permanent order, but rather that it is constantly undergoing changes, many of them violent and destructive. Did this interpretation destroy the old confidence in natural coherence? For a long time he did

not. Darwin, for example, did not allow the new way of looking at things to shake his conviction that nature manages to generate a remarkable degree of order, that despite all the disorderly opportunism of individual organisms striving for the success, from all the catastrophic upheavals of geology and climate, from all the signs of imperfect adaptation, there still remains a pattern that can be discovered in the whole of all beings. Wherever he looked, even in the most tumultuous settings, he discerned a state of beauty, even if it was more the beauty of processes than of fixed relationships. Nature, in his view, remained a system tending to equilibrium and, as such, offered some model for humanity - not a model frozen in time, but one that was completely historical, dynamic, and innovative.

Such was also the interpretation that the scientist Leopold made, and his work on earth was aimed at restoring the former vigor of that process of growth and movement. The beauty of the organic world for him rested in his continuous creativity more than in any pre-established organizational model.

At the time he was writing, scientists' ideas of ecological order were undergoing a major transition. An older notion, dominant in the United States since the early 20th century and associated with the Nebraska ecologist Frederic Clements, had argued that organic nature taken as a whole resembled some kind of organism - a "superorganism" as Clements called it. and that that entity was supposed to grow on earth until it reached a state of maturity or climax in its development. By the 1930s and 1940s that notion had lost support, although traces of it can be found in Leopold's writings and it has even persisted to the present.

The notion that replaced the superorganism was that of the ecosystem, which first appeared in 1935 at the hands of the Oxford ecologist AG Tansley. His source of inspiration was not biology but physics. Nature is organized into energy inputs and outputs, and the whole is an amalgamation of both living beings and non-living components. Ecosystems, Tansley wrote, are of the most diverse kinds and sizes. They form a category within the very numerous physical systems of the universe, ranging from the universe as a whole to the atom. The method of science ... is to isolate systems mentally in order to study them ... The systems that we mentally isolate are not only part of larger ones, but also overlap, intertwine, and interact with each other. Isolation is partly artificial, but it is the only possible way to proceed.

In other words, the notion of an ecosystem was based on the assumption that the entire universe is tightly structured through complex physical interactions and that science can make sense of that structure simply by selecting small, ordered parts of it to study and describe.

Undoubtedly, the discipline of ecological restoration owes much to these ideas, especially to the ecosystem concept. Restoration, as I understand it, has as its mission the repair of damaged ecosystems.

However, we now enter the age of agnosticism. In the last two decades many scientists have lost faith in the superorganism or in the idea of an ecosystem. A few among them, taking Tansley's ideas further than he intended to take them, have de-

clared the ecosystem idea to be nothing more than a total fiction, unverifiable, and therefore worthless. In fact, the assumption that there is some order in the whole of organic nature, or in any subset of it, has become increasingly suspect as a scientific proposition.

One of the keys to such skepticism has been the radical historicization that has been occurring in the science of ecology. Ecologists today are much more likely to be interested in describing the changes that have been taking place in the environment for thousands, even millions of years, rather than analyzing the structures and functions that exist at a given time. . Stand on any acre of ground, they say, and look back into the past; the further back you look, the more flow you will find. The entire continent of North America has been migrating across vast oceans, and on this not-so-solid land, plants and animals also come and go with incredible mobility. Nature is no longer order; it is a process of infinite change.

We historians of human communities have known for a long time that the historical mindset is intensely relativistic. Nothing lasts forever, we say, nothing is true forever. To some extent, this is a valuable discovery. It frees us from the provincialism of the present. However, it can also be a dangerous habit of thought, leaving people perplexed and insecure to the point of paralysis, demolishing all the cherished myths of tradition leaving nothing in their place. Now that it has been so fully imbued with historical consciousness, ecology is in danger of falling into total relativism. A cleared land can be considered as good ecologically speaking as one covered with forest. A landscape razed by open pit mines pouring acid into streams is as “natural” as any other. Only human subjectivity can decide which state of the earth is preferable to others.

It is true that today it is still possible for a scientist to discover a normative and unchanging forest among all those trees. An essay by the University of Wisconsin botanist Orie Loucks, titled “New Light on the Changing Forest,” published in the 1983 book *The Great Lakes Forest*, comes to mind for illustration. Loucks carefully reviews all evidence of disturbance in the forests. Discuss the gales that have ravaged up to 40,000 acres at once. Examine records of tree rings, pollen sediment, fire impact, and frost. Seen at short intervals, the forests of Wisconsin appear to be extremely choppy and unstable. However, viewed over the long term, over the last thirty million years or so, he notes, these forests are extraordinarily resilient. Despite repeated interventions and a few extinctions, “the main characteristics of the forest or the main adaptations developed during the Tertiary Era” have not changed.

Loucks is no exception, certainly, but in today’s revisionist ecology, changing (or even missing) trees have become much more of an object of emphasis than the enduring forest. Some scientists have pushed the idea of continual change in nature so far that they have begun to completely lose sight of the large-scale, long-term order and patterns that are there as well. Perpetual anarchy is all that many find today. There is no discernible direction in nature, they say, no coherent community over time, no point of “climax,” “equilibrium,” or “ripe state” that nature ever reaches, no reliable criteria by which we can assess the effect of our own interventions. There is in fact no whole, they

insist, only fragments. Nature appears in this skeptical light as a multitude of limited and concrete processes at work, all bumping into each other and never blending into a unified flow or result. It seems as if these ecologists, having completely discredited the old integrative concepts such as "the balance of nature" as too riddled with exceptions to be true or make sense, and too imprecise to be verified mathematically, are now incapable of find a new holistic idea to put in its place. Some have gone so far as to insist that all order exists solely in the human mind, that nature is nothing more than disorganized raw material upon which we are free to impose both our ideas and our desires.

It is clear that there is more than just a debate about the scientific evidence going on in ecology today. Some scientists are predisposed to discover one thing in nature, others to discover something quite different. What is seen or not seen is partly the result of where one is or, more precisely, where one chooses to be. The substantial question, therefore, turns out to be, why do so many scientists today choose to be where all they can see is disorder?

The answer to this question must come from outside the field of strictly defined science. Scientists are people embedded in their societies and cultures. Therefore, the degree of order they discover in nature, along with the degree of disorder, is inevitably influenced by their social and historical circumstances. To a certain extent, they can see what their times allow them to see. Since the mid-19th century, and especially during the last half of the 20th century or so, times have gotten increasingly messy. And this social condition has come to be reflected in the notions that many scientists have developed about the natural world.

Science is, after all, basically one of the many ways in which we human beings socially construct what we mean by reality. Put another way, scientists' models of nature, because they are the product of larger social processes, often tell us as much about the kind of people we are or think we are as what they reveal to us about nature. In the eighteenth century the world of nature seemed to be permanently stable and fixed in space since the human community seemed stable and fixed in space. During the last two hundred years, however, the pace of social change has been accelerating more and more, until we all have a historical mindset; even to the point that the past, any past, looks radically different from our own time. And some of us, being more acutely affected by the current social environment, have become agnostic or even incredulous about the very order of nature.

The most powerful forces driving this shift in cultural consciousness and the skepticism it has produced among scientists have been economic and technological. More exactly, they are the forces of modern industrialism. With industrialism I mean the extensive mechanization of production processes in clothing, food, transportation and the like, characterized by the large centralized factory. Goods in this economy are supplied to consumers, not through their own efforts, but through elaborately organized commercial markets. However, this is only the external appearance. It also has a vast, complex, and effective internal dimension: the habits of thought and perception that

are needed to make the system and its demands seem reasonable. All economic systems are, after all, mental systems in the first place. The revolution in modern production began in the mind. Or more accurately, it started in the minds of a few people, and from there spread to others, until in the end one could say that there was a whole culture of industrialism, more or less united in trying to achieve certain goals.

It is not easy to exaggerate in pointing out how far industrialism has gone in order to overthrow all the old notions of stability, community and order. Our entire way of seeing the world has been profoundly transformed by this force. Among other consequences, it has led us to think that it is necessary and acceptable to devastate the landscape in search of maximum economic production. There can be no doubt about the result; it is clearly written in the historical record of England, the United States, and every other nation that has submitted to the industrial system.

Modern industrial culture first emerged from the minds of a nascent class of entrepreneurial capitalists throughout the 17th and 18th centuries. Even today it is this group that largely dominates the institutions, politics, media and thought patterns of industrial life. We could also say, then, that we live in the culture of industrial capitalism. There are certainly some important variations of such a culture—industrial socialism, for example—but they all preach the same notion of what has value and what doesn't. Where they diverge is in their degree of interest in a fair distribution of manufactured products, in their ability to efficiently manage industrial systems, and in their willingness or reluctance to use the power of the state to impose their ideas on people. Globally, however, it has been the industrial capitalists who have ruled the roost in modern times; almost the whole world is today his factory and the fate of the earth is largely in his hands.

Any suggestion that nature has an intrinsic order that must be preserved has been seen as a serious threat by many industrial leaders. They had another rival order to create: an economic one. Industrialism has not sought the preservation of the natural order, but its total domination and its radical transformation into consumer goods. The environment has been seen as existing primarily for the purpose of supplying an infinite list of such goods and absorbing waste products and pollution. Everything that has not been produced by some industry and placed on the market for sale has had little value. It has been called, with the worst of words that industrial culture knows, as "useless." Unsurprisingly, since the only way industrialists can use nature is to disrupt it to extract the concrete commodities they value, they have considered precisely the stability, harmony, symbiosis, and integration that characterize the living world in its set, as the most useless of all features. They have tended to underestimate both the services that natural systems provide to people, for example when a forest regulates the flow of a stream, and the aesthetic satisfaction that comes from contemplating such order.

Constant innovation, constant change, constant adjustments have become normal experiences in this culture. We have forgotten for so long that life can be otherwise that we have come to accept as natural much of the chaos, uncertainty, and disintegration

that we encounter in our institutions and communities. We find it difficult today to believe in any form of stability.

One of the great critics of industrial capitalism, Karl Marx, made this penetrating observation about its destructive effects on all ideas of order and enduring relationships:

The constant modification of production, the uninterrupted disturbance of all social conditions, the eternal uncertainty and agitation distinguish [this] epoch from all previous ones. All fixed and undisturbed relationships, with their retinue of old and venerable prejudices and opinions, are swept off the map. All newly formed relationships become outdated before they can be consolidated. All that is solid melts into thin air, and all that is sacred is profaned.

Marx was thinking only of the effects of industrial capitalism on our ideas of social community, but we can see how well his words fit with our understanding of the natural order. The sense of the ecological whole that once seemed so solid and immovable has tended, along with other ideas, to vanish into thin air.

Marx believed that such destruction of traditional ideas was necessary to free people from the prejudices of the past. One cannot, therefore, find in him or his disciples much concern for preserving any holistic understanding of nature. However, the socialists believed that in the end the economic revolution must come to an end and that society must reach some stationary state of stable relations, from which it was inferred that nature must also reach some point of equilibrium, even if it were a subject to firm control by humans. Industrial capitalism, on the other hand, did not offer such a promise of an equilibrium state. Its social and ecological ideal is infinite change.

What is *truth*, what are *facts*, what is *health*, what is *beauty* in such a world? What could these words possibly mean? Total skepticism, total cynicism are the intellectual future offered by this industrial culture and its institutions.

I think it is accurate to describe modern industrial societies as something that, as a whole, actively seeks imbalance. We have learned so much to relate this condition to the possibilities of personal satisfaction, to complete self-realization, to a more abundant life, even to justice and liberation, that we have even felt threatened by any talk of maintaining or restoring the natural order. . We have feared being “stuck” or “left behind” or being held “in place” by repressive forces. For this way of thinking, the notion of preserving nature or trying to restore something like it to its order is known to evoke fear and hostility. Many of us demand a world that is disordered or, what is the same, less restrictive, in which to function.

This may be the greatest revolution in worldview that has ever taken place. Traditional societies tended to see and value order in nature; we inhabitants of the modern industrial age have tended to deny it. And that is precisely where the deep source of our environmental destructiveness lies.

Restoration must address their social and mental condition. Moreover, it must be involved to some extent in changing it - changing the economy, changing the social relations that it has engendered, changing the ideas that have emerged from those relations, changing some of the directions in which science has been moving. Today it

is not enough to buy 120 acres (even if one can afford it) and put the shovel to work. In his day Aldo Leopold understood this problem, although I think too vaguely and abstractly. Despite his devotion to his private work on the land, he recognized the need to deal more systematically with this industrial civilization so that restoration could succeed on a broader scale. In a letter to American conservationist William Vogt, he noted the idea that a restorative relationship with the land is incompatible with the dynamics of industrial civilization; the first insists that we discover and respect the order of nature; the second pushes us to triumph over it. The clear implication of that letter is that individual acts of restoration are only in the beginning. The end must be the creation of an alternative society.

How can such massive change take place? It is too much to expect that many of the richest among us, who have benefited from industrial expansion, will lead this large-scale digging, planting and restoration action. In their day they were the vanguard of change, emerging from anonymity to challenge established authority; today, with notable exceptions, they have too much invested in the current system to welcome its demise. Nor should we look to the army of industrial workers for guidance, as they will tend to follow whoever is currently giving them jobs, out of a sense of desperation and need. If the post-industrial future becomes a reality, it will be the achievement primarily of those who have been the least dependent on the old productive processes and have had the freest minds, the greatest discontent, and the most compelling alternative vision.

Some of the leaders in shaping a new post-industrial future of stability and order may well be scientists. We certainly need your talent and research. Ecology, I predict, will eventually return again with renewed confidence to some model of the whole, to some consensus about the organization of nature, as it must if it is to continue as a scientific enterprise. However, it follows from all this that I have said that the main force against industrial instability is not going to be science acting alone, as a main and independent authority.

The philosopher Alfred North Whitehead once said that if we want to find our way forward, we need to rely less on the scientific way of thinking, which he said is inevitably reductionist, and more on what he called "the habit of thought." aesthetic understanding. He was referring to an ability to see whole rather than parts. The mere accumulation of data in itself does not correct this blindness, which Whitehead considered to be the worst. In fact, it sometimes seems as if the more data we collect and the more we spread knowledge, the less able we are to see to the heart of things. He complained of "the completely blind eyes with which even the best of men [of the past] regarded the importance of aesthetics in the life of a nation." Often, he pointed out, it has been people of considerable intellect and ability who have been most indifferent to the natural order and most in need of learning to see the whole of it anew.

Of course, we can use more scientific data to improve our relationship with nature; they are known to have opened a few minds. Yet the cultural blindness from

which we suffer most severely is one that only something like Whitehead's aesthetic understanding can remedy.

Most likely, therefore, the main sources of cultural change will be those men and women who exemplify the "habits of aesthetic understanding" in a more complete and developed way. Call them artists if you will, although they will not be a brigade of specialists in any of the disciplines of the fine arts. On the contrary, they will follow the tradition of all those who, since the early years of the industrial revolution, shocked and outraged by the ugly and ruthless new modes, have constituted "the opposition". I think of them as the group of Henry David Thoreau and William Morris, of John Muir and Richard Jeffries, of HM Tomlinson and Rachel Carson and, of course, of Aldo Leopold - a group of writers, painters and scientists. Yet many of the group's members have left no novels, paintings, poems, or essays on nature, leaving no record of their thinking except the mountains, forests, and wetlands they have saved or restored. Famous or unknown, these are the people who are likely to lead us beyond today's industrial culture.

Aesthetic understanding develops through the exercise of the faculty of our minds that we associate with arts such as landscape painting, music, or poetry, although it is broader than any of these specialized activities. Different people can exercise their faculty in different ways: through science or religion, as I have already said, through bird watching, photography, or simply walking through nature with all senses alert. Whatever the activity, the essential ingredient in aesthetic understanding is the ability to look beyond the level of isolated detail and perceive its underlying cohesion. Details are still important, but the habit of looking at them too closely for too long can atrophy the aesthetic faculty. You lose awareness of how things are linked together, how they form patterns with each other, how they fit together. Nature then ceases to please the eye and in the saddest cases the eye does not even know that it should please it. When aesthetic awareness is well developed, on the other hand, the deep harmony in it is easily and certainly seen, and the pleasure it brings is intense. Terms like "beauty" and "integrity" immediately come to mind. In fact, such qualities become the most significant realities that exist and their perception and enjoyment is the highest form of life.

The beauty discovered in nature through aesthetic understanding has repeatedly inspired people to try to build harmonies of their own, whether in landscape, song or painting. All human art, I am sure, has its main impulse in the profound observation of nature. We see the close relationship between its parts, the adaptation of its means to its ends, its marvelous suitability, and, impressed by what we have seen and heard, we begin to express it in our own limited way. In every period of history and in every corner of the earth, people have done just that, from the gardens of Japan to the hedgerows of rural England, from the aquarium in a child's room to the miniature rainforest recreated in the hallway of a modern office building. None of these recreations is "nature" in the final and complete sense of the term, but all are attempts by the

human mind to find some part of the whole that it can reach, imitate and make its own.

However, in these times we feel more and more compelled, like Aldo Leopold, to try to repair the beauty of the earth instead of merely selecting and copying it. Before, he didn't seem to need our help; was our radiant model. Now, however, for those whose aesthetic faculty is vigorous and who seek inspiration, much of that greater glory of nature has vanished, and cannot be rediscovered in our lifetimes.

It was this degradation of natural beauty that Leopold lamented at his abandoned farm. He felt that it was not merely a stupid and unfortunate misuse of a resource; it was morally wrong. Every person or nation has the right to derive sustenance from the land and to participate in the processes of natural creativity; but no one, no matter how desperate his situation or how lofty his ambition, has any right to reduce the complexity, diversity, stability, fertility, integrity, and beauty - in short, the order - of the world. natural. Everyone has a responsibility, whether they recognize it or not, to make a living in such a way as to preserve that order. This is, verbatim, what Leopold called the idea of a "land ethic."

I believe that this idea, one of the most important that has been raised in the 20th century, should be the basis of the field of restoration ecology. If it were taken into account consistently, at least as consistently as any principle was always taken into account, none of our institutions, philosophies, systems of knowledge, or ways of life would remain the same. Something bigger than pine trees would rise from the sands of Wisconsin.

In the industrial age we have made the mistake of ignoring beauty altogether or assuming that it is something that human beings must impose on the chaotic realm of nature. A more complete and humble perspective would be to see that nature constitutes a different form of order, greater than anything that we, acting as a single species, can create. It is not a kind of order that, after being finished at a certain time, is wrapped up, sold, and then hung on a wall or placed on a library shelf. Nature is a creative work that has been in the making for billions of years; it was already forming before any mind translated it into human understanding. It is an inventive process of incessant and infinite creation, the work of anonymous, even invisible crowds. It has no underlying purpose that we are able to discover and agree on, yet at every moment it manifests an order far more complicated and wondrous than any substitute we have been able to conceive. It is the most complete order that we can discover. In the work ahead to restore some of that creativity to a degraded land, we can, with Aldo Leopold, see anew how much we have forgotten.

Presentation of "THE WILD CHARACTER AND THE DEFENSE OF NATURE"

The following text is a "difficult" piece of writing to evaluate, not so much because of the style in which it is written, since it is easy to read, but rather because of its content, in a certain lucid and correct way and, at the same time, in a certain way, neither so lucid nor so successful.

The text is basically a criticism that someone who loves wild Nature makes to others who also say they love it and want to protect it (most conservationists) but who are either not aware that the wild, the autonomy of Nature, is actually something very different from what they are trying to protect in practice: mere biodiversity, a landscape or ecosystem managed to keep it looking more or less natural, a controlled "wild" fauna, etc. And it is a strong and radical criticism in many aspects, which points out some of the contradictions and intrinsic problems and even, to a certain extent, insoluble in the conservation of Nature.

The author obviously has some very well directed intuitions that point directly to the heart of certain problems related to the protection and preservation of Nature. Unfortunately, your ability to express those insights clearly, logically, and consistently is not always up to the task.

But let's see and comment a little more in detail on their mistakes and successes.

Among the *hits*, it should be noted:

- The identification of the autonomy of Nature with the wild character.
- Not falling into the typical mistake of identifying biodiversity with wildness. The author, unlike most conservationists, recognizes that biodiversity is not necessarily synonymous with wilderness or autonomy in ecosystems.
- In relation to the above, not to confuse defending and preserving the quality of being wild with merely defending and preserving things that until recently have been wild. Trying to conserve species, landscapes, ecosystems by interfering in their own dynamics and processes, without respecting, preserving or favoring *at the same time* their autonomy and independence from human management, is not really conserving or restoring Nature wild, but the opposite: to eliminate and prevent the wild nature of Nature, to tame it.

- In relation to the above, the rejection of the management of Nature, understood as interference in the autonomous processes of ecosystems and their replacement by manipulation by human beings, even when this manipulation often occurs as a necessary means to preserve Nature. Active management implies control and tends to generate permanent dependency, apart from unwanted and undesirable effects, which ruin the autonomy of Nature. It is therefore incompatible with the wild nature of ecosystems.

- The recognition of the impossibility of predicting and, therefore, controlling (managing) completely, effectively and innocuously complex systems and processes. Management is not only undesirable from a wilderness preservation standpoint, it is also largely unfeasible and ineffective.

And among the *errors*:

- The author exaggerates and makes the gross mistake of considering that declaring an area protected is always the same as creating an artificial environment. However, regardless of what the cases are in reality, considering an area as protected should not necessarily imply in all cases creating something in it that was not already there, at least in theory, and it would not necessarily imply any kind of active management or interference in its wild character. The exaggerated interpretation of the author would suppose in practice a total rejection of the protection. For the author, protected areas are no longer wild by the mere fact of being protected. It is not well understood how protection or even certain forms of scientific research (the use of radio transmitter collars, for example) necessarily always eliminate the autonomy of Nature and the author does not explain it clearly and concisely. Of course, it is not the same, as far as the effects on the wild character of Nature are concerned, simply declaring an area protected and monitoring it to prevent activities that damage it (poaching, for example) from being carried out of the same (suppression of natural fires, control of the size of the populations of species, artificial feeding of the fauna, etc.). The former does not necessarily interfere with the autonomy of Nature, the latter does, altering its own dynamics and creating dependencies on human management.

Moreover, even within the "management" of Nature itself, the author does not seem to take into account the important differences between *specific* actions aimed at favoring the recovery of non-artificial ecosystems and their autonomy, for example, reintroducing an indigenous species that has been recently extirpated, and artificially maintaining certain species, communities or ecosystems through *permanent* management.

It seems as if the author, in some way, was not able to differentiate between his subjective and emotional perception of wild Nature and the objective fact of the existence of wild character in Nature. Both things can go together and be related, but they are not the same. Certain things, such as radio transmitters placed on wildlife or regulations aimed at the legal protection of species and ecosystems, can actually spoil the subjective experience of the wild (and this is certainly something serious and must be taken into account) , but they do not always necessarily imply an objective diminution of the wild character of Nature. A bear with a radio transmitter is no less savage than one that does not, even if it is less "pleasant" to see it with a collar.

In addition, the alternatives that the author proposes in the face of the protection and management of Nature, "establishing large areas in which we limit all forms of human influence", on the one hand, and preaching a conservationist ethic based on the wild and redesign or reform civilization based on it, on the other, or they are basically the same as what already exists, at least in theory, in protected wilderness areas (for example, in the "wilderness areas" of the US Wilderness Act) , which he criticizes, or they are impossible and ineffective proposals. Changing society's prevailing ideas about Nature (if it were really possible, attempted and achieved) would not significantly change society's harmful effects on Nature and its wildness, because such effects are above all the result of factors, processes and material conditions that are inherent to techno-industrial society and largely independent of non-material factors (ethics, values, ideologies, etc.). A society consisting of millions of individuals and using advanced technology *inevitably* needs to occupy and transform vast expanses of land and *inevitably* causes impacts on wild ecosystems. As long as it exists, it will always deal damage to the wild. It doesn't matter what the prevailing ideology is. And the author in this regard falls into the same error as most of the conservationists whom he criticizes: he believes that modern technology and society and wild Nature could be compatible; that the former could be reformed ideologically to respect the autonomous character of the latter. This is probably why he avoids even mentioning the other existing alternative: physically eliminating the techno-industrial society.

- Although Turner generally, in the text, considers that the wild character of Nature consists in its autonomy, sometimes he introduces other notions of the wild character along with it, mixing them all. And it is not clear that such other notions are really or necessarily the same as, or even always compatible with, the autonomy of the non-artificial. That is if they really mean anything. For example, he sometimes considers wildness to be the "vitality" of Nature, whatever that may be.

- True to his idealistic philosophical position, Turner considers the desire for control as the fundamental reason why civilization eliminates the wild character of Nature. In fact, it reduces modern civilization to a mere "ideology of control projected on the whole world", completely leaving aside the physical or material aspects of techno-industrial society. However, the desire for control or any other ideological aspect of modern society is merely a consequence of the material development of that society, not its cause. In some cases, this consequence can act as a positive feedback mechanism, reinforcing the direction of social and technological development and, therefore, aggravating its effects on Nature, but it is not their fundamental cause. In fact, in most of the dynamics of current social maintenance and development, the desire for control or any other conscious and voluntary purpose is absent, although the result of the same is in effect a greater manipulation, dependence and control over what is not. artificial. The maintenance and development of the techno-industrial social system is already to a great extent an autonomous and non-teleological process, which develops and follows its own dynamics independent of any intention or will and, therefore, of any ideology.

- Unfortunately, Turner, perhaps trying to find intellectual references to be able to formulate and publicly present his, in general, correct intuitions, makes use of certain more than questionable theoretical currents. The text is deeply influenced by post-modernism and other trends somewhat related to it (Foucault's theories about social control, chaos theory, paradigm shift theory, rejection of abstract thought, etc.), so fashionable in the time it was published. Unfortunately, the author does not seem to be aware that these currents, largely irrationalist and relativist, have been much more often used to attack the notion of the wild and the defense of Nature (as can be seen, for example, in many of the other texts published in this section) than to the contrary. Hence, for example, the author's stupid and incongruous rejection of any abstract notion of the wild, what he calls "the abstract wild", despite the fact that he himself uses and preaches constantly notions of this kind (as if defining the savage character as the autonomy of Nature were not in itself something abstract!). The author goes so far as to say, "I don't want to know about grizzlies in general, nor can I care in any practical way about grizzlies in general. I want to know and care about the grizzly bear that lives in the canyon above where I live. And I have more confidence in myself and my friends and that grizzly than I do in managers sitting at universities a thousand miles away who have never seen this place or this grizzly bear and want it all to fit into a mathematical model." What is the relationship between the healthy and rational distrust of experts and their techno-scientific methods and the rejection of any abstract or general notion about Nature? None. And, going more practically, who will worry about defending those wild species and ecosystems and their autonomy when they do not concern their immediate human neighbors? The unbridled navel subjectivism of the author sometimes ruins his argument.

Moreover, Turner seems unaware that behind much of the relatively recent scientific theory and research on complexity lies the same classic goal of effectively controlling and manipulating Nature. If mathematicians, physicists and some avant-garde ecologists who speak of chaos are attracted to the study of complex systems and processes, it is not usually to demonstrate the absurdity of trying to predict and control them and reject their manipulation, but precisely because deep down many of them hope to gain (more) control over them through a better understanding of their complexity. The idea that scientific knowledge should serve mainly to apply it to the manipulation and control of reality continues to be present even, ironically, in many of those scientists who have discovered that the dynamics that govern the development of reality are largely unpredictable (and therefore uncontrollable) measure.

Also, in part, it is possible that the author is sometimes simply falling into another typical vice of philosophers like him: citing references to pretend and thus fraudulently get recognition of his presumed intellectual authority on the subject matter. Like when, for example, he says that the front of a fire is a fractal[a]. Was it necessary to mention fractals in this text to argue that natural processes are largely unpredictable and therefore uncontrollable? No, the author only mentions it to show that he is familiar with chaos theory, in which the fractal concept is certainly of great importance.

- Lastly, despite his rejection of the experts and their scientific methods applied to the control of ecosystems, the author proposes as an alternative a new ethics of conservation based on a notion of the wild as a result of the interdisciplinary efforts of (eco) feminists, philosophers (postmodern), mathematicians (of chaos, it is supposed), physicists (of complexity, it is supposed), etc. However, why should we trust these new “experts” more than the old ones (ecologists, foresters, conservation biologists, etc.)? What do feminism or abstract mathematical theories have to do with the notion of the wild and the defense of Nature?

That without going into talk about how inadvisable it is to leave the definition and defense of the wild in the hands of people more concerned with social justice and other progressive and humanist values and goals, or with the resolution of mathematical and philosophical “riddles” than with maintain and recover the autonomy of Nature.

A fractal is a geometric object whose basic structure is repeated at different scales.

THE WILD CHARACTER AND THE DEFENSE OF NATURE

By Jack Turner

Thoreau began by speaking of the wildness[c] as the preservation of the world in a lecture he gave at Concord Lyceum on April 23, 1851, entitled “The Wild”[d]. In June of the following year he combined it with another lecture on walking and published both as the essay “Walking, or the Wild” in *Atlantic Monthly*. This essay remains the most radical document in the history of the American conservation ethic, and, as distinguished Thoreau scholar Robert Richardson pointed out, “How we understand that ethic will depend on what we think Thoreau meant by ‘the wild’. [e]”.¹

Thoreau understood the wild[f] as a quality: wild nature, wild men, wild friends, wild dreams, wild house cats, and wild literature. He associated it with other qualities: the good, the sacred, the free. In fact, he equated it with life itself. By freedom he understood not rights and freedoms, but the autonomous and the self-regulated[g]; and by life, not mere existence, but vitality and life force. These connotations are not restricted to our culture. Gary Nabham has pointed out that “the O’odham[h] term for wildness, *doajkam*, is etymologically linked to terms for health, wholeness, and vitality.”¹

Thoreau’s famous phrase “in the Wild is the preservation of the World” says that wildness preserves, not that we should preserve wildness. For Thoreau, wildness was a given; his task was to make contact with it and express it, and he believed that the myth expressed it best. His success was not due to political action or scientific study, but to personal effort. More than anything, the wild[401] was a project of the self.

¹ Original title: *The Vanishing face of Gaia*.

After Thoreau, the focus of our conservation ethic shifted from wilderness to the preservation of wild ecosystems[j], habitats and species, and more recently biodiversity. This turn was clearly materialistic, a movement from quality to quantity, to land surface, to species and to physical relationships. The privileged status that classical science and its technologies enjoy in our culture practically implied this materialism, since classical science and its mathematics could not describe qualities such as wildness; and what cannot be described is ignored. The wild[k] understood as a quality, as well as its relationship with other qualities, is something that is rarely talked about today, being Gary Snyder's book *The Practice of the Wild* the honorable exception.

The change was also reductionist. By preserving things - the area, the species and the natural processes - we believed that we could preserve a quality. Unfortunately, collections of areas, species, and processes, however large and diverse, do no more preserve wilderness than large and diverse collections of religious artifacts preserve sacredness. The wild[402] and the sacred are simply not the kind of things that can be collected. Historic forms of access and expression can be preserved but you can't put a quality on a museum. In the same way, the wild character cannot disappear. It can be reduced, in nature and in human experience, but it cannot cease to exist. The world contains many things that exist but cannot be collected and put in one place - the set of complex numbers, gravity, dreams. The wild character is something similar and we are not very clear about how to preserve it.

There are excellent reasons to preserve wild ecosystems, biotic communities, and biodiversity apart from any relation to wilderness, reasons that are fully discussed in our environmental literature, but these materialistic and reductionist turns in our conservation ethic have reduced the wild character of the places, species and processes that we have managed to preserve by diminishing their autonomy and vitality. Unfortunately, our conservation ethic tends to ignore this loss.

This decline will continue as our attempts at preservation -parks, protected areas[m], zoos, botanical gardens- are thought with reference to certain modern institutions, mainly the laboratory and the museum, institutions that are opposed to autonomy and vitality. . In the past, political and aesthetic criteria selected the samples; in the future (hopefully) biological and ecological criteria will be predominant. However, no matter how broad the selection, the selection and implementation processes render the samples artificial. Environments (and their occupants) are selected and managed according to human goals - the preservation of landscapes, of resources, of protected areas[n], of biodiversity. Our artifice alters their order profoundly, tearing them out of the larger context of interconnectedness that created that order. As Anthony Giddens says in discussing the consequences of modernity, "The 'end of nature' means that the natural world has largely become a 'created environment' consisting of human-structured systems whose driving forces and dynamics they derive from presumed socially orga-

nized knowledge rather than from influences exogenous to human activity.”² This is just as true of national parks and protected areas[o] as it is of Disneyland.

The environments created have that aura of hyperreality so common in modern life. “They are all renewed forms of Cain’s desire to return home remaking the original creation. The tragedy is that trying to recover paradise we accelerate the murder of nature”.³ Nature “ends” because it loses its own self-ordered structure, that is, its autonomy, that is, its wild character. The environments created also reek of the “museum-like” quality made famous in Theodor Adorno’s essay “Valery Proust Museum”: “The German word *„museal”* [of or relating to the museum] has unpleasant connotations . It describes objects with which the observer has no vital relationship and which are in the process of dying” (175). Just as cultural museums “are testimony to the neutralization of culture” (175), I believe that the museums of the types of territories, despite being diverse in habitats and species, are testimony to the neutralization of culture. nature.

A created environment is a castrated nature[p], a nature[q] with which we no longer live in a vital relationship. Museum objects may be useful, entertaining and informative, and nature taken as a laboratory may produce whole branches of new knowledge, but their objects of study have lost their own organizing principles and can be aptly described as relics - the remnants left behind after destruction or decay of original things that are preserved as objects of veneration.

In this sense it is possible to see the Earth as something more and more typical of a museum - in the process of becoming a relic; an order that was once autonomous transformed by a single species for its own use, a species that in a combination of mourning and respect preserves bits and pieces for worship, study and entertainment. The few remaining fragments of wild ecosystems have long been valued as a laboratory - hence the title of Aldo Leopold’s essay “Wilderness as a Land Laboratory”[r].⁴ Nature under stress becomes another interesting science experiment, a problem to be solved, not unlike a sick patient, a long-term unemployed, a broken machine. Instead of a collection of gods (as in the case of the Greeks) or the source of the Sublime (as in the case of Kant and the Romantics) or a wellspring of moral teachings (as in the case of Emerson, Thoreau, and Muir), nature is subordinated to humans -dependent. A patient. So, his philanthropic sensibilities heightened by the crisis, Mr. Man rushes to help the poor thing back on its feet with GPS systems, computerized databases, shelters, genebanks, and radio collars.

² Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

³ An example: “*You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.*” (*Earth’s Vengeance*, page 38).

⁴ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

[or] “Designer wilderness” in the original. See footnote 1. *N. from t.*

[p] “Neutered wild” in the original. *N. from t.*

[q] “Wild” in the original. *N. from t.*

[r] “Wild ecosystems as a laboratory of the earth”. *N. from t.*

We have recently discovered that our land museums are of a type too small, disconnected and artificial to allow species to maintain their own structure and order. Our remedy for these isolated ecosystems and relict populations is to create larger, better-crafted environments based on new theories, more data, and better management practices. This may result in more complete ecosystems and may maintain some species, but the increased human influence and control mechanisms required for selection and preservation simultaneously reduce the self-organization and wildness of ecosystems. The remaining “wilderness areas” become less and less natural as they are subjected to the management necessary for their survival and, ironically, become less and less capable of fulfilling their supposed scientific purpose - to serve as a reference for natural processes in basis against which to measure the health of the human-controlled world.

An example of this process can be found in the Wildlands Project[s] proposed by Wild Earth[t]: “a program for the restoration of the wild ecosystems of North America” (which at first sounds like a great thing for the planet). If successful, it would be the largest created environment in the world. Its order and structure - the cores, corridors, buffer zones, and densely populated areas - would certainly be visible from space. I think of it as an America designed by Foreman, Noss and their partners[u].⁵

Many feel the character of a Disney park and the museum aspect of wilderness areas, national parks and wildlife reserves, but continue to believe that these places offer a refuge from human artifice. This has always been an illusion. National parks manage millions of human visitors at the expense of natural processes. Wilderness Act “wilderness areas” allow the state to control fire, insect, disease, and animal populations; build roads for human use; graze cattle; and practice mining. These environments are not wild - they are too well known, designed, managed, managed and controlled to be wild.

All of this suggests that we need to devise a new conservation ethic based on wildness. What we come to understand by “wildness” might emerge from current interdisciplinary efforts by feminists, mathematicians, philosophers, and physicists to understand control, prediction, dominance, and their opposites: autonomy, self-organization, self-regulation, and autopoiesis. .⁶

⁵ A couple of examples:

⁶ For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

In his “diary”, Thoreau wrote that “wild”[404]⁷[406][407][408] is the past participle of the verb “to will”[w]: “self-willed”[x]. A new ethics of the wild[y] should highlight Thoreau’s reference and confirm the recent scholarly trend that interprets “wilderness” in its original sense of “self-regulating land”.⁸ That would reinforce the most important word in the most important fragment of the Wilderness Act: “untrammelled”[z]. And finally, it would further Thoreau’s project of understanding that, both within ourselves and in nature, the wild[aa] is fundamentally one and the same because of its conceptual relationship to vitality and freedom.

***II

To build a new conservation ethic, we first need to understand why we impose a human order on non-human orders. We do it to win, consisting of said gain in an increase in predictability, efficiency and, consequently, control. Faced with the accelerating destruction of ecosystems and the extinction of species, we believe that our only option lies in better prediction, efficiency and control. So we fight to preserve ecosystems and species, and accept the decline of their wildness. This allows us to win the battle but causes us to lose the war, and in the process, we just stop talking about wildness.

We do this in many ways. For example, we start talking about “protected areas”[bb] instead of talking about “the wild”[cc], as in Thoreau’s commonly misquoted phrase: “In the *wilderness*[dd] is the preservation of the world”[ee].⁹ However, most (if not all) of our Wilderness Act protected natural areas[ff] are not wilderness. Take, for example, the Gila Protected Area[gg], which is a cattle pasture, not self-regulated land[hh]. Thoreau did not say that extensive livestock is the preservation of the world.

We also tend to equate wildness with biodiversity. For example, Chapter 2 of Roger DiSilvestro’s book *Reclaiming the Last Wild Places: A New Agenda for Biodiversity* is titled “Biodiversity: Saving Wildness” and contains phrases such as “the wild character in nature, that is what we preserve when we protect biodiversity” and “the protection

⁷ “Wild” in English. *N. from t.*

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out* , page 237).

of biodiversity, of the wild[ii]" (25). But wildness is not the same as biodiversity. In *Desert Smells Like Rain*, Gary Nabham describes two oases. The Papago-occupied oasis[jj] had twice as many bird species as the "wild" oasis preserved at the Organ Pipe Cactus National Monument.¹⁰ Neither oasis was wild in any reasonable sense of the term, and the more remote desert oases might well have even fewer species. And if so, what? Is wildness less important than biodiversity? should we preserve

[z] "Unfettered" in English. *N. from t.*

[aa] "The wild" in the original." See footnote c *N. from t.*

[bb] "Wilderness" in the original. *N. from t.*

[cc] "Wildness" in the original. *N. from t.*

[dd] "Wilderness" in the original. *N. from t.*

[ee] The author refers here to the fact that Thoreau's phrase was actually "In *wildness* is the preservation of world" ("In *the wild* is the preservation of the world"; italics added), that is, Thoreau was referring generally to the character of all that is wild and not just to the wilderness; and even less to the areas declared legally protected. *N. from t.*

[ff] "Wilderness" in the original. *N. from t.*

[gg] *Idem. N. of the t.*

[hh] "Self-willed land" in the original. *N. from t.*

[ii] "Wildness" in the original. *N. from t.*

[jj] Native people of southwestern North America. *N. of t.* the latter at the expense of the former? What criteria should we use to decide on this matter?

For many conservation biologists (though not Nabham, of course) the important distinction is between "in the wild" and "in captivity", with "in the wild" referring to being in a managed ecosystem. However, if grizzly bears in the wild are controlled by radio collars and relocation programs, then what has become of Thoreau's central issue: freedom? It has simply been sidelined in the preservation discourse .

We also ignore wilderness when we define wilderness in terms of the absence of humans. In "Aldo Leopold Metaphor", J. Baird Callicott points out that with the exception of Antarctica, there is no land mass that has not been subject to human presence and therefore wilderness as defined by the Wilderness Act is an "incoherent" idea. " (45).[kk] Other people deny the existence of the wild[409] saying that any human influence on a species or ecosystem destroys the wild character, and since human influence has been taking place for a long time time... well, there is no such

¹⁰ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

thing as wild [mm]. This is absurd, and one wonders what Lewis and Clark would have thought, standing on the banks of the Missouri, about all this chatter. “This is not a wilderness[nm]. Because there are millions of human beings out there. And it’s not natural either[oo]. Human influence has been spoiling this place for 10,000 years.”

There is something wrong here, and I think the cause may be that most of the people who are writing and thinking about wilderness issues[pp] only know about the Wilderness Act wilderness areas. A week in the Amazon , in the high Arctic or on the northern slopes of the Himalayas would suggest to them that what counts as wilderness and wilderness is determined not by the absence of people, but by the relationship between people and place. A place is wild when its order is created following its own organizational principles - when it is a self-regulating land. Native peoples usually (although definitely not always) “adapt” to that order, influencing but not controlling it, though probably if they don’t it is not because they have a superior set of values but because they lack the technical means to do so. Control increases with civilization, and modern civilization, being very much about control - it is an ideology of control projected onto the whole world - must control the wild[qq] or deny it. This perspective is clearly represented by the dystopian novels, beginning with Yevgeny Zamyatin’s *We*.

Although autonomy is often confused with radical separation and complete independence, the autonomy of systems (and I would say human freedom as well) is reinforced by interconnectedness, elaborated interaction[rr], and feedback—that is, the influence. In fact, such processes create a possibility of change without which there is no freedom. Determinism and autonomy are as inseparable as the multiple interpretations of a gestalt image.

What is important is that whatever the type of autonomy in question - human freedom, lands with their own will[411]¹¹, self-regulating systems, self-organizing systems, autopoiesis - they are all incompatible with external control. To take wildness seriously is to take the issue of control seriously, and because the disciplines of applied biology do not take the issue of control seriously, they are littered with paradoxes - “wildlife management,” “wildlife management,” “wildlands”, “managing for change”, “managing natural systems”, “mimicking natural disturbances” – which we might call the paradoxes of autonomy. Sets of paradoxes often mean bad news for scientific paradigms, and I believe that the biological sciences are facing a major revolution.¹²

¹¹ “Self-willed land” in the original. *N. from t.*

¹² For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

II

Since the time of Aldo Leopold, the biological sciences have played an increasingly dominant role in conservation ethics. If the goal is to preserve ecosystems and species, then one turns to the experts in the field: ecologists and biologists. During the last twenty years it has become evident that the individual disciplines of applied biology are not broad enough to achieve preservationist goals, especially biodiversity, and that they need to be integrated into the new disciplines of population biology and ecology. -that is, in conservation biology. Conservation biology has an increasingly dominant role in preservation in this country[tt], if not the world, and the big environmental organizations that once led the fight for preservation often follow their agendas.[tt] 12]

Unfortunately, conservation biology is also about control. It integrates controls that were already available in the biological, physical and social sciences, which leads us to what we could call meta-management. Since biodiversity is *understood* following the model of a scarce resource, the preservation of biodiversity becomes a problem *similar* to resource management.¹³ In the face of biodiversity loss (and it is true that there is such a crisis), conservation biology demands that we do something, now, in the only way that counts as doing something: more money, more research, more technology, more information, more ground surface. Trust the science, trust the technology, trust the experts; they know what is best. In short, the prescription for treating the disease is even more control.

This reflects the way of responding to crises usually treated in Michel Foucault's studies of madness, crime and disease. Like psychiatry, criminology, and clinical medicine, conservation biology is a theoretical discipline that seeks control by pursuing a morally pure mission: ending a crisis. Although the ills on which these disciplines focus have always been with us (and have been handled in more imaginative ways by other cultures), they are aggravated by the conditions of modernity - overpopulation, urbanization and pathological social structures - and by the globalization of these conditions.

Unfortunately, instead of acting on the causes, modern theoretical disciplines such as conservation biology try to control the symptoms. Its controls are directed at Others, not at our own social pathologies. This is reminiscent of the difference between preventive medicine and intrusive medicine: instead of rebuilding ourselves and our societies, modern theoretical disciplines strive to remake the nonhuman world and reduce its autonomy. In the long run, this tends to fail as the world resists and adapts to our intrusions, and we, in turn, discover the true cost of our attempts at control.

These controls always have a disciplinary or proto-disciplinary character, and here the multiple meanings of "discipline" are not accidental. They involve capture (shooting, throwing darts, setting nets and traps, catching, stopping); isolation in special areas (guards, prisons, shelters, protected natural areas[uu]); numerical identification

¹³ Examples:

(tattoo and brand everything from prisoners and soldiers to swans and grizzly bears); technological representation (photography, X-rays, GPS cartography); chemical manipulation (of germs, brain, fertility); surgery (lobotomies for the insane and, for predators, the implantation of radio transmitters or radioactive plates that make their feces visible from satellites); follow-up (radio transmitter collars on animals, control anklets on prisoners, cardiac monitors on heart patients); and constant vigilance to accumulate more and more information. Having already seriously interfered with the human body and mind, we now attempt to meddle with the rest of creation, thus confirming the prognosis of Ecclesiastes: "For whatever befalls the sons of men, will befall the beasts."

Justified in the name of normality and balance - just as wars are justified in the name of "peace in our time"[vv] - disciplinary technologies tend to develop in the form of great programs of salvation: economic wars against poverty, criminological wars against crime. Despite some sporadic small victories, these wars fail. Prisons create more criminals and poverty and hunger grow with modern economies. Unfortunately, these failures neither devalue these disciplines nor stop these wars. Like Avis, disciplinary technologies simply try harder, that is, they try to control more and better.

Conservation biology sits in this tradition of salvation in a big way. He wants to wage a war for biodiversity, so he adopts a mission and strategy (from the Greek term for the army: *stratos*) to remake the natural world according to his own vision . I predict that it will fail for the same reason that other disciplines fail: it does not act on the

[uu] "Wilderness" in the original. *N. from t.*

[vv] "Peace in our time" in the original. It refers to a phrase from the speech given in 1938 by British Prime Minister Arthur Neville Chamberlain upon returning from signing the Munich Agreement. Shortly after, World War II would begin. *N. of the t.* causes of the evils that it tries to treat but that it continues being therapeutic. Its main purpose is to stop the symptoms and it wrongly assumes that the disease is acute rather than chronic.

The real change comes from altering the structure, not from treating the symptoms. The structure that a radical ("root") environmental stance has to change is the system of positive feedbacks formed by overpopulation, urbanization, outrageously high living standards, grossly unfair distribution of basic goods; the union of classical science, technology, the state and the market economy to maintain that high standard of living; the infinite presumptions related to our rights, freedoms and privileges; and the complete absence of a spiritual life that can mitigate these forms of ambition. In short, the preservation of wilderness, wilderness and biodiversity requires a revolution against social pathology, a transformation of Western civilization - and let's face it, many of us cower in the face of such a challenge. We prefer to control nature,

In ecology, the most powerful expression of an ethic of control of nature is represented by the book[<http://www.naturezaindomita.com/resenas/discordant-harmonies>][*Discordant Harmonies: A New Ecology for the Twenty -*] [<http://www.naturezaindomita.com/resenas/discordant-harmonies>][*First Century,*] by

Daniel Botkin. Botkin presents graphic evidence of the devastation caused by uncontrolled elephants in Tsavo, one of Kenya's largest national parks. Scathingly points out that our current ideas about nature are outdated, requires more management, more information, more monitoring, more research, more investment in environmental education. He defends the preservation of wilderness areas mainly as references for scientific measurements. It is a compelling book. The conclusion drawn is that "Nature in the 21st century will be a nature made by us; the question is to what degree such modeling will be intentional or not, desirable or not" (193).

Botkin is not alone. In an essay titled "The Social Siege of Nature," Michael Soulé, one of the founders of conservation biology, says:

Some of the ecological myths discussed here contain, explicitly or implicitly, the idea that nature is self-regulating and capable of taking care of itself. This notion leads to the theory of management understood as benign neglect - nature will do just fine if we humans just leave it alone, thank you. In fact, a century ago, the "no touch" policy was the best policy. Today is not...

Homeostasis, equilibrium, and Gaia are dangerous models when applied to the wrong spatial and temporal scales. Even fifty years ago, letting nature take its course might have been the best medicine, but that was a world with much larger spaces, much less humanized and much more connected, a world with a third of today's human population and a world largely unaffected by chainsaws, bulldozers, pesticides and invasive alien species.

The alternative to letting nature fend for itself is to actively care for it - in today's parlance, affirmative action[ww] of wilderness. (159160)

Stewards of the cosmos ? A nature made by us? This is the *reductio ad absurdum* of the American conservation movement. The one that used to be

[ww] "Affirmative approach to wildlands" in the original. *N. of the t.* goal of conservation - the preservation of the natural world and its own order - has been reduced to abandonment; in fact, to benign abandonment, an expression that hints at a lack of concern for nature. And what is good then? Positive discrimination - the typical liberal trick. If you don't agree with conservation biology, you'll end up in the corner of *those who don't care about nature* because the debate has been framed in anthropocentric terms: what is the best medicine that *< em>can we* manage the poor sick old world? Soulé's Manichaeian management policy simply repeats the facile rhetoric of the 1960s.

What does this imply for Thoreau's seemingly outdated idea of wildness? The true consequences of this management paradigm are clearly stated by Davis M. Graber, a research scientist in the National Department of Biology¹⁴, in a text on management in national parks:

The parks are progressively becoming ecological islands as the surrounding landscapes are converted to agricultural land or are developed. Therefore, as the climate

¹⁴ "National Biological Survey" in original. *N. of. t.*

changes, hopefully leading to the local extinction of species in the parks, the entry of many native "replacement" species -those adapted to the new climate- will be blocked by the isolation. The intentional introduction or maintenance of native species could in some cases be used to facilitate the introduction of species that might have arrived on their own before habitat fragmentation, as well as to preserve the survival of other species that would no longer be there. sufficiently adapted to survive in the new climatic and ecological conditions. In fact, such intensive management is likely to be necessary to preserve plant and animal species that already have a local distribution.

Decidedly, this way of managing the parks renounces the contemporary notion of the wild[yy]. In fact, we have ended up condemned to take care of the rest of life in a transformed world.¹⁵

Certainly this is a dilemma. We want to protect and preserve wilderness, but it seems that to do so we have to accept a rather uncompromising scientific positivism which in the biological sciences takes the form of an equally uncompromising management style. The result of this management style is that we can only save biodiversity by destroying nature's own wild order. The alternative, "letting nature solve problems," is not taken seriously. Indeed, it has become anathema, since even our pathetic attempts at control would be better than letting the natural order rule the natural world.

These attitudes are about to become a matter of social policy. A recent book of essays on ecosystem health suggests that "there is an important basis for a broad consensus if the concept of health is given its primary identity as a public concept."¹⁶ This removes the "health of nature" as a property of the world, reduces it to human politics, and in return ensures that biologists and ecologists will set about fixing the world with treatments and corrective actions. This is the irony of Soulé's essay: he laments the social siege of nature but fails to see that the biological sciences are leading the attack; as if, somehow, biology and ecology were not part of the fabric of social construction.

Ecological management is the normalization and disciplinary control of Folcault projected on ecosystems from social institutions. The Otherness[zz] of the natural world is consumed by current social politics, and the new doctors of nature carry out their mission -evangelists doing their work once again among the savage populations

¹⁵ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁶ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

(today plants and animals instead of peoples) bringing the gift of modern order and our current version of salvation - the preservation of biodiversity.

This salvation involves trust in abstract systems, and since the lay person lacks both the knowledge and the ability to assess the foundations of these abstract systems, our trust is less a matter of knowledge than of faith. Those who are old-fashioned will put their trust in themselves and those they know rather than in abstract systems. Some, of course, will say that the two are quite compatible, but ultimately they are not: when it comes down to it, you have to decide what to trust. Reliance on abstract systems and experts rips our relationships with nature from its proper context. This is precisely why many of us no longer trust science: it ignores individual places, peoples, flora and fauna.

I, for example, don't want to know about grizzlies in general, nor can I care in any practical way about grizzlies in general. I want to know and care about the grizzly bear that lives in the canyon above where I live. And I have more confidence in myself and my friends and that grizzly than I do in managers sitting at universities a thousand miles away who have never seen this place or this grizzly bear and want it all to fit into a mathematical model.

***IV

In this situation, one would like to believe that radical environmentalists can offer something different from what the big environmental organizations and conservation biology offer. Unfortunately, this is no longer so clear.

Over the last five years conservation biology has extended its influence in radical environmentalism, inverting themes that once legitimized its radical content. The transformation of part of Earth First![aaa] into Wild Earth was a shift from personal trust and confrontation to trust in abstractions and conciliation with technology. In this transition he gained new followers (and a lot of financial support) and lost others. He certainly lost me. While science, technology and modernity were once part of the problem, today they are an important part of the solution and I fear that the Wildlands Project may reduce Wild Earth - certainly one of our best radical environmental organizations - to be the political arm of a scientific discipline.

[zz] "Otherness" in the original. *N. from t.*

[aaa] Radical environmental group that emerged in the United States in the late 1970s. In the mid-1980s, some of its members left and some of them created the *Wild Earth* magazine and the organization The Wildlands Project. *N. from t.*

Again, though, the key issue is control and autonomy, not science. Some recent issues of *Wild Earth* and *Conservation Biology* have captured debates about land management and wild systems[bbb], but they have not penetrated to the bottom of the issue. Writing in *Wild Earth*, Mike Seidman concluded his contribution by saying, "It seems that the depth of my criticism of management has gone unnoticed." Seidman was being chivalrous, since the other part of the "debate" was a lengthy *non sequitur*. [414]

The autonomy of natural systems is a thorny issue in our conservation ethics and, while recognized, no one is honestly tackling the issue. The problem appears in many

forms. It explains the growing discontent with our predator control, with the hunting of elk in Grand Teton National Park, with the killing of elephants to manage them, and with the capture and training of the last condors[ccc]. It explains the growing discontent surrounding the reintroduction of wolves to Yellowstone National Park. For a decade ecologists fought for the introduction of an experimental population; now, seeing the biological and political control to which this experimental population is subjected, many people would have preferred natural recovery - no matter how long it took.

Biological controls are ubiquitous. Biologists control grizzly bears, trap and radio-collar cranes, put cute little radio-transmitting backpacks on frogs, pin brightly colored plastic buttons to the beaks of harlequin ducks, even put radio-transmitters on minnows . And always for the same reason: more information for a better and healthier ecosystem. Information is inseparable from control, something that was already pointed out in great detail by James R. Benninger in *The Control Revolution: Technological and Economic Origins of the Information Society*. It is the main point, perhaps the only one, of surveillance.

What we need most, now, is to start imagining an alternative. Perhaps we do not need more information; the emphasis on biological inventory, species recovery, surveillance and monitoring may be yet another step in the wrong direction. What can be radical in all this? The Nature Conservancy has been doing it for years, as has the Department of the Interior. Trying to be radical about, say, biological inventories is like trying to be radical about laundries: it's not big enough, conceptually, to get to the root of the problem.

Radical environmentalists' obsession with roads and dams reveals a crude idea of the industrial destruction of nature and blinds us to less obvious modern control technologies involving even more potent modes of destruction. And so we have deep ecologists like George Sessions and Arne Naess who, instead of making a blanket critique of control, support genetic engineering, in theory or in practice.[415]

Somehow and increasingly, the key issue is obscured by secondary issues. We need great wild ecosystems, great natural habitats, not more technological information about them. Why not work to establish large areas where we limit all forms of human influence: no conservation strategies, no design of protected wilderness areas[ddd], no highways, no trails, no satellite surveillance, no helicopters flying over them. without radio transmitter collars, without measuring devices, without photographs, without GPS information, without databases loaded with the location of each one of the drabas[eee] on the top of Mount Moran, without guide books, without topographic maps ? Let whatever habitat we want to preserve revert to its own self-organization as much as possible. Let the wilds go back to being blank spaces on our maps. Why don't radical environmental organizations fight for that? I suspect that much of the answer has to do with this: there is no money in it and, like all non-profits, they need a lot of money just to survive, let alone achieve something.

V

There are two ways of understanding "preservation", and most preservationists have followed the first: the conservation of things. Canned strawberries embody this type of preservation. The other way of understanding preservation is the preservation of processes: letting things be themselves. Dough Peacock presents this second meaning with great clarity, calling biology "Biofucking"[fff] and saying "Leave the fucking bears alone".[416] This is reminiscent of Abbey's phrase "Let being be", quoting Heidegger, who in turn stole it from Lao Tzu:

Do you want to improve the world?

I do not think it could be.

The world is sacred.

It cannot be improved.

If you tamper with it, you'll ruin it.

If you treat it like an object, you will lose it.

The Mistress sees things as they are, Without trying to control them.

She lets them go their own way, And resides in the center of the circle.[ggg,19]

Although most of the public believes in the preservation ethic, leaving things alone is definitely the new minority tradition among preservationists. However, let us carefully consider the warning "If you tamper with it, you will ruin it. / If you treat it like an object, you will lose it." This goes to the heart of what I call "the abstract wildness" - the converted wildness objectified and filtered through concepts, theories, institutions, and technology.

What if the effect of the creation of environments, the treatment of ecosystems and the management of species by scientific experts were (sometimes? often? always?) just as bad or worse? than the effects of unmanaged nature? In a nutshell, let's put aside the question, "Should we manage nature?" and ask ourselves, "How well does (can) nature management really work?". Ecologists tend to avoid talking about it for fear of helping the enemy, but the matter requires careful examination.

In an essay titled "Down from the Pedestal: A New Role for Experts," David Ehrenfeld, who was for many years the editor of *Conservation Biology*, presents several examples of predictive failures in ecology and the unfortunate consequences. they have had for natural systems. Consider, for example, the introduction of opossum shrimp[hhh] to northwestern lakes for the purpose of increasing sockeye salmon[417] production. "The story is complicated, involving nutrient amounts, water levels, algae, various invertebrates and lake trout[jjj], along with the interaction of all of them. However, the bottom line is that the sockeye salmon population declined rather than increased, and this in turn affected the populations of bald eagles[kkk], various species of seagulls and ducks, coyotes, minks, river otters, and grizzly bears, as well as human visitors to Glacier National Park." Indeed, Ehrenfeld goes on to say that "biological complexity, with its myriad internal and external variables, with its myriad possibilities, places

ecology and wildlife management a little closer to the bottom of the scale. reliability occupied by ... economics experts" (148-150).

The economy ? Really? And this is being said by one of the doyens of conservation biology? Should we entrust the management of nature to experts whose reliability is similar to that of economists? This takes a bit of splendor away from nature reconstruction projects, doesn't it? I would not let them manage even the garden in front of my house.

Ecologists are compared to economists because they have problems with prediction. Prediction (some believe) is the essence of science: Without prediction there is no science; bad prediction, bad science. Unless (according to this view) the biological sciences can generate accurate and testable quantitative predictions, they are well on their way to joining the lousy science of, say, astrology. Well, if your idea of good science requires quantitative predictions, specifically long-term quantitative predictions, then all 20 sciences seem to be a bit of a mess, especially ecology.¹⁷

Ecological historian Donald Worster, in his essay, "*The Ecology of Order and Chaos*," notes that "Despite the evident complexity of the subject matter that is their subject matter, ecologists have been among those that have been slowest to join the interdisciplinary science of chaos" (168). This is not entirely fair. Robert May, an Oxford mathematical ecologist, is one of the pioneers of chaos theory and his book *Stability and Complexity in Model Ecosystems* remains a classic. Yet even so, what Worster says remains revealing, and one suspects that ecologists' lack of openness on the subject probably has something to do with the disturbing consequences it would have for the practical application of their discipline - and, consequently, for their payrolls. They continue to cling to the hope of better computer models and more information, but as Bretch said in another context, "If you keep smiling, you haven't understood the news."

Most of the rapidly growing literature on chaos and complexity is either journalistic or extremely technical.¹⁸ Of greater importance to radical thinking about the environment are the philosophical implications of chaos and complexity and their impact on those biological disciplines we rely on to guide environmental policy. An excellent discussion of the above appears in Stephen H. Kellert's book *In the Wake of Chaos: Unpredictable Order in Dynamical Systems*, which suggests, as do Ehrenfeld's examples, that the problems The practical applications of ecology and biology face are more

¹⁷ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

¹⁸ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

formidable than these disciplines are willing to admit.¹⁹ Required reading for understanding the impact of chaos theory on ecological theory is Stuart L. Pimm's essay, "Nonlinear Dynamics, Strange Attractors, and Chaos," in *The Balance of Nature? Ecological Issues in the Conservation of Species and Communities*, a sobering book for anyone who thinks we either understand these issues or have enough empirical data to make smart decisions about long-term ecosystem management.

Many biologists and ecologists believe that the autonomy of nature is a naive ideal and that we must now try to control the Earth. Ironically, this view is widespread, even though recent work on nonlinear dynamics demonstrates nature's talent for self-organization, indeed its talent for organizing itself into critical states that unpredictably collapse into avalanches of the very events that disturb us so much - earthquakes, fires, extinctions, epidemics. In fact, many natural systems seem to be drawn into imbalance (or, I would say, wildness).²⁰ Some of the largest and most catastrophic events - like the Yellowstone fires of 1988 - are precisely the unpredictable events that are the key to the formation of the vegetation architecture that is basic to the order of an ecosystem. And yet, they are the events we most want to manage.

What emerges from the recent work on chaos and complexity is the discarding of the metaphor of the world understood as machine and the emergence of a new metaphor - a vision of a world characterized by vitality and autonomy, a vision close to the Thoreau's sense of wildness, a vision that, of course, goes far beyond his own, but which he would have found glorious indeed. Instead of one huge machine, much of nature turns out to be a set of dynamical systems, much like the formidable lines of eddies in Lava Falls, where the description of turbulence is a nonlinear differential equation containing complex functions, with "free" variables that prevent obtaining a solution (closed form). Such natural systems are unstable; they never stay in balance. (Aficionados of kayaking know this from experience.) They are aperiodic; like the weather, they never repeat themselves, but always generate new changes, and one of the most important is evolution. Life evolves on the edge of chaos, the area of maximum vitality and change.

Dynamical systems marked by chaos and complexity have an order, and the order can be described mathematically. They are deterministic and we can (usually) compute probabilities and make qualitative predictions - about how the system will *generally* behave. But, with chaos and complexity, scientific knowledge again becomes limited in ways similar to the limits imposed by incompleteness, uncertainty, and relativity.

This does not end science; what it leaves out, really, is long-term quantitative prediction, and this affects most of science in one way: control. However, that is the crux of the matter. As John Ralston Saul said, "The essence of rational leadership is control justified by experience."²¹ Without control, there are no experts. The biological

¹⁹ "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

²⁰ Page 114.

²¹ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. N. from trans.

sciences lose their leadership in conservation ethics. The tradition of “preservation as management” that began with Leopold is over as there is little reason to trust experts to make smart long-term decisions about nature.

Without accurate prediction and control, what happens to the rationality of managing species and ecosystems? If the microsystems of an ecosystem, from vascular flows to genetic drift to turbulence - plus all the natural disturbances of ecosystems: weather, fire (the forest fire front is a fractal), the wind, earthquakes, avalanches) - exhibit chaotic and/or complex behavior and some organize themselves globally to critical states that result in catastrophic events and, even more so, if such behavior does not allow long-term quantitative predictions. term, then isn't ecosystem management somewhat a sham and management of grizzlies and wolves a mockery at best? If an ecosystem cannot be known or controlled with scientific data, then why don't we just stop talking about the health and integrity of ecosystems and honestly admit that it is only a matter of social policy, not science?

Much of the best intellectual work of this century has led to the admission of various limits in science and mathematics - of systems of axioms, of observation, of objectivity, and of measurement. This should foster humility in all of us and the limits of our knowledge should determine the limits of our practice. The life sciences should set limits to their operations in the wilderness - in the wilderness²², in the Wilderness Act[yum], in any wilderness area - for the same reasons that nuclear scientists should accept limits when messing with atoms and geneticists should accept limits when messing with the structure of DNA: *We are not that wise, nor can we be.*

The question is not the legitimacy of science in general, nor the legitimacy of a particular scientific discipline, but what are the appropriate limits to be established for any discipline given our limited knowledge. To ignore these limits is to relinquish humility and undermine the foundations of the preservation movement. Accepting these limits and envisioning a new conservation ethic based on wilderness and humble, careful and non-intrusive practice would unite Thoreau's insight that “in the Wild[nnn] is the preservation of the World” and the traditions of ancient wisdom with the intuitions of our most radical avant-garde mathematicians and physicists, ecofeminists, and ecofeminists. This is as comforting as it is charming.

All knowledge has its shadow. The advance of biological knowledge in what we call the natural world simultaneously promotes the processes of normalization and control, forces that diminish the wild character that arises from the very order of nature, the same order that, supposedly, is the object of preservation . At the center of the current conjunction of preservation and biological science - Leopold's legacy - lies a contradiction. We are faced with a choice, a choice that is fundamentally moral. Ignoring it is mere cowardice. Will we reshape nature by following biological theory or will we accept the wild?

²² “Core wilderness” in the original. *N. of t.*

The wild character is out there. The most vital beings and systems live on the edge of the wild character. The next time you howl with delight like a wolf, howl for unstable aperiodic behavior in nonlinear dynamical systems. Lao Tzu, Thoreau and Abbey will be happy.

Grades:

1. Richardson, *Henry Thoreau*, 225.
2. Nabhan, "Cultural Parallax in Viewing North American Habitats," in *Reinventing Nature*, eds. Michael Soulé and Gary Lease (Washington DC: Island Press, 1995).
3. Giddens, *Modernity and Self-Identity*, 144. See also his book *The Consequences of Modernity*.
4. Gary Coates, quoted in Jerry Mander, *In Absence of the Sacred*, 149.
5. In Leopold, *The River of the Mother of God and Other Essays*.
6. See Reed F. Noss, "The Wildlands Project," 10-25.
7. Given women's experience of being dominated, much of the best writing on control has been written by feminists. See Susan Griffin's *Woman and Nature: The Roaring Inside Her* and Carolyn Merchant's *The Death of Nature*.
One of the best discussions of autonomy is found in chapter 5 of the second part of Evelyn Fox Keller's book *Reflections on Gender and Science*. On autopoiesis, see Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition* and *The Tree of Knowledge*. On self-organizing systems, see I. Prigogine and I. Stengers, *Order out of Chaos*.
8. For Thoreau's "Diary" and an examination of the "savage character," see Sherman Paul, *The Shores of America*, 412-17. For a text on "wildlands" understood as "self-regulating lands," see Jay Hansford C. Vest, "Will of the Land."
[nnn] "Wildness" in the original. *N. of t.*
9. Richard B. Primack made this common mistake in *Essentials of Conservation Biology*, 13.
10. Nabhan, *The Desert Smells Like Rain*, chapter 7. See also Peter Sauer's introduction in *Finding Home*.
11. See Paul Hoyningen-Huene, *Reconstructing Scientific Revolutions*, on paradoxes in scientific theories.
12. See Chapter 1 of Primack, *Essentials of Conservation Biology*.
13. See the diagram linking conservation biology and resource management in Primack, *Essentials of Conservation Biology*, 6.
14. Graber, "Resolute Biocentrism," 131.
15. Robert Constanza *et al.*, *Ecosystem Health*, 14.
16. Mike Seidman's original letter appeared in *Wild Earth* 2 (Fall 1992): 9-10. Reed F. Noss, WS Alverson, and DM Waller's responses to this letter appeared in *Wild Earth* 2 (Winter 1992-93): 8-10. Seidman's reply is in *Wild Earth* 3 (Spring 1993): 7-8.

17. Salleh, "Class, Race and Gender", 233.
18. Quoted in Rick Bass, "Grizzlies: Are They Out There?".
19. Lao Tzu, *Tao Te Ching*, chapter 29, English translation by Stephen Mitchell. Mitchell deserves the Nobel Peace Prize for having used the feminine gender.
20. For chaos and predictive failures in classical economics, see Richard H. Day, "The Emergence of Chaos from Classical Economic Growth."
21. A classic, of course, would be James Gleick's book *Chaos: Making A New Science*. See also M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos*. The most accessible introduction to the technical aspects is John Biggs and F. David Peat's book, *Turbulent Mirror*. For comments on chaos in branches ranging from ecology to quantum physics, see Nina Hall (ed.), *Exploring Chaos: A Guide to the New Science of Disorder*.
22. For a general introduction to the problem of prediction see John L. Casti, *Searching For Certainty*.
23. See Per Bak and Kan Chen, "Self-Organized Criticality" and Per Bak, "Self-Organized Criticality and Gaia."
24. Saul, *Voltaire's Bastards*, 10.

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²³ There is a Spanish translation: *The consequences of modernity*. Editorial Alliance, 2008. *N. from t.*

²⁴ There is a Spanish translation: *Complexity: Chaos as a generator of order*. Tusquets, 1995.

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[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/presentacin-de-el-movedizo-terreno-del-desarrollo-sostenible-la-ecologa-del-orden-y-del-chaos-and-restoring-the-natural-order/la-ecology-of-the-order-and-of-caos>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/presentacin-de-el-movedizo-terreno-del-desarrollo-sostenible-la-ecologa-and-chaos-and-restoring-the-natural-order/the-ecology-of-order-and-chaos>][shaky-terrain-of-sustainable-development-the-ecology-of-order-and-of-chaos-and-restoring-the-order-][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/presentacin-de-el-movedizo-terreno-of-sustainable-development-the-ecology-of-order-and-chaos-and-restoring-the-natural-order/the-ecology-of-order-and-chaos>][natural/the-ecology-of-order-and-chaos.]

[eeee] There is a Spanish translation: *Nosotros*. Akal, 2008. *N. of t.*

THE SUSTAINABILITY OF WILD NATURE

By Ralf Buckley¹

The questions (a) Can the world still “afford” wilderness²? and (b) should we try to use them “sustainably”? at first glance they are simple. The direct answers are (a) yes and (b) no. However, as the quotes I’ve added indicate, these are politically charged questions and the terminology used is misleading. They are made in the context of continually increasing human population pressure. And they are largely done by lobbies for primary industries, from small-scale farmers and ranchers to multinational oil and mining conglomerates, logging industries and tour operators. Such interest groups claim that we should use nature³ “in a sustainable way”. His arguments are purely political. We need wild ecosystems to sustain life. Here I explain why.

Affording something means having enough money to buy it. The total monetary cost of purchasing all currently remaining high biodiversity areas at current local prices is estimated at \$20 billion per year for ten years. This is less than the annual US spending on soft drinks. So yes, on a global scale we can afford the wilderness.

However, most wilderness is not for sale, except politically. They are controlled by national governments that protect, exploit or ignore them depending on their own economic and political power bases. Ecuador, for example, despite having had a \$30 billion lawsuit over damages caused by the oil industry in a national park, now wants to produce oil in another park unless it receives an international payment of many billions of dollars. Dollars. Since you want the money up front and with no strings attached, there is no real guarantee that there will be any protection afterwards.

A much more important question is whether we can afford the continued loss of wild ecosystems globally. We depend on relatively undisturbed natural ecosystems to clean the dirty air and water that constantly emanate from our cities. If the air of the cities were not constantly replaced by the winds that bring clean air from nature⁴, the people who live in them would die just like when someone breathes the fumes from the

¹ Translation and adaptation by Último Reducto of “The Sustainability of Wilderness” and “Can We Afford Wilderness?” by Ralf Buckley (*On line Opinion*, March 10, 2010).

² “Wilderness” in the original. The term “wilderness” refers to areas or ecosystems that are not very humanized. Here, unless otherwise explicitly stated, it has been translated as “wild areas”, as “wild ecosystems” or as “wilderness”, depending on the context. *N. from t.*

³ “Wilderness” in the original. *N. from t.*

⁴ *Idem. N. of the t.*

exhaust pipe of a car in a closed garage. If urban rivers did not flow to the sea and fall as rain in upstream basins, people in these cities would be poisoned by a mixture of industrial waste and human fecal waste.

Wilderness areas, especially oceans, grasslands, and tropical forests, also help absorb atmospheric carbon, mitigating human-induced climate change. The only realistic way to extract carbon from the atmosphere is to put it back in the ground. “Biocharning” is an attempt to do this artificially, but it is much cheaper and more effective to simply keep those areas covered by native vegetation and let the plants maintain soil fertility. Permaculture may have the same effect, but it is not very likely that the world’s food supply will be produced by permaculture in the near future. Current farming and forestry practices in most parts of the world typically reduce the organic matter content of the soil, drawing carbon out of the soil and putting it into the air. So wilderness areas mitigate the impacts of climate change caused by human activities elsewhere.

Wilderness also provides the genetic diversity that sustains our food, textile, and pharmaceutical industries around the world. It is plants and animals that provide the specific chemicals that we use to make almost all of our drugs and medicines. Wild plant and animal species also provide the genetic material that allows us to continue creating new varieties of staple food crops and livestock, while older varieties continually succumb to new pests and diseases. This is why pharmaceutical and agricultural companies pay so much for “bioprospecting” rights, the opportunity to survey wilderness areas for potentially valuable species.

Ten years ago a group of economists calculated that the recurrent financial value of the goods and services that human societies obtain from the natural environment is at least twice that of the entire global economy: many tens of trillions of dollars a year. Most of that consists of what they call “ecosystem services” – clean air and water, genetic material, etc. – and most of those are produced in the wild. So wild nature is definitely something we can’t afford to miss out on.

Since we can afford to keep nature wild and cannot afford to lose it, is it perhaps possible to use it “sustainably”? This is misleading terminology, for two reasons.

First, we already use wild nature, all the time, as it keeps the planet habitable for human beings. Every time we breathe and every drop we drink means using the wild nature.

Second, the concept of sustainability, which is vague at best and in most cases used as a lame excuse to avoid the stark reality that environmental science presents, is entirely scale dependent. On a global scale, there are large areas where the human economy consumes the natural environment: towns and cities, mines and factories, logged areas, and most farmland. Since human beings, as biological creatures, are completely dependent on the natural environment, they can only survive as long as there are also areas where that environment is not being consumed: that is, wilderness areas.

On a local scale, in fact, small numbers of human beings with few material demands can live in natural environments that are barely modified and that provide them with

economic and environmental services at the same time. This is the basis of subsistence economies. However, as long as we have a large, industrialized human population living in cities and eating food from intensive agricultural production, we cannot also occupy wilderness areas at the same time. Many thousands of years ago, there were few human beings and all of them led a subsistence way of life. Today, although a few people still lead a subsistence way of life, in total there are many people and most of them lead an industrial way of life. In these circumstances, nature has to be kept in the wild⁵ so that the world as a whole remains “sustainable”, in the sense that it constitutes a place where human beings can continue to live.

In general, there are four main groups of people who want to use nature⁶ for purposes other than sustaining life on a planetary level.

Wilderness ecosystems not within protected areas are continually depleted and degraded by high-impact human uses ranging from clearing for agriculture to logging and fisheries to oil production. Specifically, at a global level, the timber industry still depends to a large extent on the continuous invasion of new areas with primary forests not yet cut down. These usages are the way the world economy works today. They are supported, favored and often subsidized by national governments, through deals ranging from land occupation to publicly funded infrastructure construction. That is, they are seen as something normal; They are the usual way of working. However, they are steadily reducing the area of wilderness globally, on which we depend for survival. The area situated within national parks is not enough on its own.

Even within protected areas, wild ecosystems are still undergoing some reduction, albeit at a slower rate. In many developing nations, parks are protected on paper but not on the ground and are subject to continual illegal incursions. In both developed and developing nations, the oil and mining industries continuously push for the right to operate within the parks, claiming that this will not destroy their value for conservation and for the preservation of natural resources. nature⁷. In fact, for example, it is possible to dig a small surface hole whose impact is very limited. In the real world, however, the oil and mining industries create massive impacts through networks of roads and seismic lines, discharges of mine effluents or toxic drilling compounds, and the influence of people, trucks, helicopters, and heavy machinery. They can't help it, because that's how the industry works. It depends on contracts and subcontractors, and when a bulldozer works, it does so subject to deadlines and cost control. That's good for a mine, but not for the wild.

At the opposite end of the spectrum, the national parks of most countries are routinely used for recreation as well as conservation. This produces impacts, but they are relatively minor and manageable. In modern times it has become part of nature conservation policy⁸ to assume that park administrations must constantly work to please

⁵ “Wilderness must be kept as wilderness” in the original. *N. from t.*

⁶ “Wilderness” in the original. *N. of the t.*

⁷ *Idem. N. of the t.*

⁸ *Idem. N. of the t.*

the electorate and be self-financing⁹. Opening the parks to independent recreation is one of the main ways they are trying. The people who walk through the parks as a form of private recreation is easily manageable and, in addition, this activity represents savings in public health, hospital and geriatric spending. It's true, Parks Victoria's¹⁰ slogan, "Healthy Parks, Healthy People", is not just a catchphrase. It is part of the state budget.

Halfway between mining and individual excursions, there is the commercial tourism industry. National parks, especially areas that are World Heritage Sites and similar iconic places, are important attractions for both national and international tourism. Three-quarters of foreign visitors to Australia, for example, visit at least one national park during their stay. The commercial tourism industry sells transportation, accommodation and certain activities to these tourists. In fact, at least a quarter of the entire Australian tourism industry bases its business primarily on natural areas, although this includes both private and public land.

In most parts of the world, tourist accommodation and infrastructure are in access areas outside the parks themselves and all activities within protected areas are controlled by park administrations. This works well, as park managers can manage visitors to minimize conservation impacts. It also works well for the tourist accommodation and trade sectors, as they are closely linked to the broader residential property sector, which is driven more by permanent migration based on quality of life¹¹ than by short-term vacation visits. This approach works well even in highly visited parks, such as those in China that receive tens of millions of visitors a year.

Also, there are private properties, especially in sub-Saharan Africa and South America, that are managed as reserves financed through tourism, especially through wildlife-based tourism. In these cases, the tourist accommodations are built within the reserves. However, this is something very different from public protected areas. Private landowners are running a business using their own means. They are not necessarily trying to contribute to global conservation, which is the goal of public protected areas. In addition, in private reserves, tourism revenues must cover all costs of land management and conservation of the entire property, as well as all tourism infrastructure and international marketing. In public parks these costs are paid by the taxpayers of each country. It is something very different.

It is therefore not surprising that commercial property developers view publicly owned parks and wilderness areas as bargains, opportunities to profit from the public purse. If they can build tourist accommodation within well-known parks, then the costs of attractions, infrastructure, management and marketing will all be publicly subsidized. And if, in addition, developers can negotiate exclusive rights to provide lodging

⁹ "Political constitutions and operational funds" in the original. *N. from t.*

¹⁰ The author, who is Australian, refers here to the entity that administers the parks and protected areas of the state of Victoria in Australia. *N. from t.*

¹¹ "Amenity migration" in the original. It refers to the fact that some people move their residence to places they like for non-economic reasons (environmental, cultural, etc.). *N. from t.*

and commercial services in certain parks, then these developers obtain a monopoly rent, the opportunity to raise prices and reduce services by not having competition. While this generates profits for that developer, it imposes disproportionate costs on park administrations, on less affluent independent visitors, on other tourism agencies and industries in the region, and on wilderness areas that support the entire human race. So we can neither afford it nor is it sustainable.

The term the tourism industry uses to promote this approach is “participation”¹². This is another one of those misleading terms.

Tourism agencies want to use the resources of public parks and have a say in park management practices. But, of course, they do not offer park administrations the resources of their companies nor do they offer park staff the chance to participate in running their business. So it’s not a “share” in a business sense. Promoters of tourist property say they could make the parks money. However, in those cases where tourist agencies already have to pay park fees, for example an amount for each person’s entrance, they complain bitterly. Very few tourist agencies make donations to the parks they use. They make money, yes, but not for the park administrations. We cannot expect this to change.

There are a few park administrations in the world that actually get most of their funding from tourists. In the case of South Africa it is about two-thirds and in the case of Quebec, in Canada, it is about four-fifths. However, they obtain them directly by charging fees to visitors. They also have commercial agreements with tourist agencies, but these constitute only a twentieth of the total income, and these agreements are not even enough to cover the costs. There are privately run hotels in some US national parks, but they were built in pioneer days and have been giving trouble ever since. There are campsites managed by concessionaires, but subject to the strict regulations of the parks.

The suggestion that hotels inside parks rather than outside will somehow contribute to conservation is simply not supported by the facts; It’s just advertising manipulation. And people don’t want hotels inside the parks. What they want is to be able to go to the parks cheaply and camp. When Parks Victoria wanted to build a hotel inside Wilson’s Promontory National Park a few years ago, there was more protest than any previous development proposal in that state. People want wilderness just the way it is. And more and more, since there are more and more people and fewer wild areas.

Finally, this brings us to the main obvious problem that no one wants to acknowledge, namely continuing population growth. In fact, unless the global population stabilizes and declines soon, all other conservation measures will end up being useless. One way or another, every year we human beings consume several times more than the planet can produce. This is possible in the short term, since we are consuming the natural resources accumulated throughout the history of the Earth. In financial terms, we are mortgaging the farm or squandering our trust fund with no way out once the

¹² “Partnership” in the original. *N. from t.*

money runs out. Anything we do to protect the environment will be nothing more than stopgap measures until we can reduce the human population. Today, however, the world's human population continues to grow, and as countries such as China and India become richer, resource consumption per capita increases as well. Meanwhile, governments worry only that they will lose their tax base as workers retire. The current Australian federal government wants to increase immigration so as to multiply Australia's population to nearly double its current size. It is certainly a mystery how anyone can be so short-sighted. And this cannot be expected to end well.

So the bottom line - and it's a triple bottom line really, social, economic and environmental - has been clear since the days of the pioneers: "In the wilderness¹³ lies the hope of the world."

¹³ "Wilderness" in the original. *N. from t.*

Presentation of “ON ANY MAP”

In Wild Nature we previously included another text by Jack Turner: “The wild character and the defense of nature”, so that some of the criticisms already mentioned in the presentation of that text are equally valid for this one (see [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-carcter-salvaje-y-la-defensa-de-la-naturaleza>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el->][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-carcter-salvaje-y-la-defensa-de-la-nature>][wildness-and-the-defense-of-nature]).

In any case, here it is worth explicitly pointing out one of the most noteworthy weak points of this author: his marked attraction to “eastern traditions” (Buddhism, Hinduism, Taoism) is a sign of his somewhat hippie tendencies, with all that this implies. entails: a certain irrationalism, a certain logical and mental disorganization, a remarkable subjectivism centered on the personal, etc. that tarnish other very valuable aspects of his philosophy, such as his radical defense of the concept of the wild or his rejection of the active and technological management of ecosystems. It is not uncommon for it to focus excessively on useless and inconsequential action at a personal or local level and give great importance to “spiritual” aspects. And that the interview excerpts included here are the ones that focused the most on the earthly world!

However, we believe that this interview deserves to be read, since despite everything it raises interesting questions that give a lot to think about.

ON NO MAP: Jack Turner talks about our loss of intimacy with the natural world¹

A few months after meeting writer Jack Turner in Jackson Hole, Wyoming, to talk to him about the wildness², of the wilderness^{3,4}[⁵], of loneliness and the roots of Western civilization's environmentally destructive trends, sent me an email with the subject line "Griz". There were two photos attached: the first showed a pair of bears next to a picnic table half buried in snow. The second had been taken through a steamed-up window, on the other side of which was a bear standing on its hind legs, its muzzle flat against the glass. "There are grizzlies in the cabin," the email read. "So I won't be able to go anywhere for a few days."

This was by no means Turner's first encounter with a wild bear. Since 1978 he has lived at the foot of the Tetons, one of the most spectacular mountain ranges in North America, usually in cabins without electricity or running water. This retired mountain guide believes that to really love a place, one has to forge an intimate and bodily relationship with it and that achieving it today is an "achievement". One cabin in which he lived, a twelve-foot-by-twelve-foot⁶ wood-panel shack located within Grand Teton National Park, was only accessible during the winter months by skiing or snowshoeing along four miles⁷ from the nearest clear runway. Temperatures sometimes reached 40 below zero. Weeks passed without making any visit to a town. He says the years he spent there with his wife, Dana, and their dog, Rio, were the best of his life.

Raised in Washington, DC and Southern California, Turner grew up in a family of outdoorsmen. His grandfather co-owned a hunting and fishing camp in northern Pennsylvania and his father hunted and fished year-round. Turner earned a bachelor's degree in philosophy from the University of Colorado and went on to study Chinese and philosophy at Stanford and Cornell. Shortly thereafter, he accepted a teaching position

¹ Translation by Último Reducto of some excerpts from an interview with Jack Turner conducted by Leath Tonino, which appeared in *The Sun* (August 2014). The complete original in English can be read at: [<https://www.thesunmagazine.org/issues/464/not-on-any-map>][<https://www.thesunmagazine.org/issues/464/not-on-any-map>]. *N. from t.*

² "Wildness" in the original. Although here it has been translated as "wild character", in this text, unless otherwise indicated, it will be translated simply as "the wild". *N. from t.*

³ "Wilderness" in the original. This term, which lacks a similar term in Spanish, refers to areas with little or no humanization in which Nature follows its own dynamics. Depending on the context it can be translated specifically as "wild lands", "wild ecosystems" or "wild areas" or, more generally, as "wild nature". Here it will be translated as "wildlands", "wild ecosystems" or "wilderness areas", unless explicitly stated otherwise. *N. from t.*

⁴ "Griz" is a diminutive of "grizzly", which is the common name given in North America to grizzly bears (*Ursus arctos*). *N. from t.*

⁵ "Griz" is a diminutive of "grizzly", which is the common name given in North America to grizzly bears (*Ursus arctos*). *N. from t.*

⁶ 1 foot = 30.48 centimeters. *N. of t.*

⁷ 1 mile = approximately 1.6 km. *N. of t.*

at the University of Illinois at Chicago, but felt less comfortable in classrooms than out in the wild. Obsessed with climbing since the 1960s, in the mid-1960s he and some of the best climbers in the US took on some tough routes in Yosemite National Park and Colorado. He loved climbing more than philosophy, so he stopped being a teacher. The mountains were calling him and he heard their voice.

To this day, at seventy-two years of age, Turner has probably spent more time in nature seeking the wild and the wilds than any other person you will ever know. For forty-two years he has worked for Exum Mountain Guides, a company based in Wyoming, guiding clients on ascents of the Grand Teton (13,776 feet) and other nearby peaks. He has climbed the Grand Teton approximately four hundred times and has participated in more than forty trips and expeditions to Pakistan, India, China, Tibet, Nepal, Bhutan, and Peru. In his spare time he has hiked, canoed, fished, bird-watched and camped - often alone and always without a GPS - across North America. Friends of mine who live in Jackson Hole have told me that they sometimes run into Turner when they're out hiking. One once saw him at the edge of a steep ridge, surrounded by wild flowers, meditating on a flat rock. Another saw him crawling in the snow at his wife's feet with a magnifying glass in his hand, talking excitedly.

Turner is the author of three non-fiction books: *Travels in the Greater Yellowstone; The Abstract Wild* and *Teewinot: A Year in the Teton Range*. In all three, he interweaves personal anecdotes from nature with philosophical discussions, quotes from Chinese poets and Buddhist masters, and natural history lessons. He has received a Whiting Foundation Writers Award, and his work is now taught in more than fifty university environmental studies programs. He has been a visiting professor at the University of Utah, but these days turns down most offers to speak or teach, preferring to stay close to and around home.

When I first contacted Turner for an interview, I had this fantasy of having to ski through powder snow to get to his cabin and then sitting by the wood stove all day, my socks drying. while we chatted. But it turned out that the Sunday afternoon in February when we met, Turner was busy - he had guests at his house - and he arranged for us to have the interview at the office of a friend of his who is a lawyer, downstairs in the town of Jackson. hole. We walked into a conference room with a sleek black table, black leather-upholstered swivel chairs, and flat-screen monitors on the walls. For a mountain man, Turner seemed oddly at ease, which is testament to his adaptability. He jumps lightly from topic and word to topic, from Zen poetry to ocean acidification to iPads.

Tall and strong, with a bald head and a well-groomed white beard, Turner has a commanding presence. Often throughout the three hours of conversation, he would get heated up about some subject and lean in closer, pressing his finger on the table. However, I was also impressed by how wise and kind he is. He brought with him a bag of clementines, although we never stopped to eat them.

Tonino: What exactly do you mean by "wild"?

Turner: I mean something that has a will of its own⁸, that is autonomous, self-organized. It's basically the opposite of controlled.

You can see the wild in the movement of glaciers, or you can spot it in star formation in the Orion Nebula. The wild is everywhere. From microscopic particles to beyond 13,000 million light years in the cosmos. It's in the ground and in the air, it's on our hands, it's in our immune systems, it's in our lungs - in which there are two thousand bacteria per square centimeter! In a sense, much of what we think of as *us* is actually *not us*. We breathe and the wild enters. We do not control it.

Tonino: You have called the wild "an experience in danger". What do you mean by that? If we are impregnated by the wild, isn't it just a matter of perception?

Turner: It has to do with scale. On one scale you have the Orion Nebula, which is twenty-six light-years away and has a mass two thousand times that of the sun. At the other extreme is the scale of quantum physics, of subatomic particles, zooplankton and proteins. The scale on which Henry David Thoreau and the American conservation movement focus is that of voles, coral reefs, redwood forests, and whales. We're especially interested in wilderness on that scale - and for good reason - but that scale doesn't encompass *everything* of wilderness. And therein lies the problem: today very few people directly experience voles, coral reefs, redwoods, and whales. You can live in San Francisco, take the bus to work, look at a screen, come home, look at a screen, and so on over and over again, day after day. I ask my environmental studies students how much time on average they spend each day being in *direct* contact with nature. Thirty minutes, they answer me. And what do they do then? Walk between classes. They tell me that they look at a screen between eight and twelve hours on average a day. These kids haven't spent a lot of time walking through remote areas. They don't have much personal experience with wild creatures. They also don't have much experience about isolation. Parents these days can hardly schedule taking their kids to participate in nature activities such as a backpacking hike, because that will take them off Facebook for two weeks.

At the Exum Mountain Guides Climbing School we forbid our students to bring music to the Tetons. *They hate* not having music. They don't want to be alone. They are already hive creatures, much more so than past generations were, fiercely hooked on their social networks, which are an important part of their identity.

I am part of the Jackson Hole astronomy community. Our club is having more and more trouble getting young people to go out in the dark - the cold, creepy dark - and look at the stars. They want to look at the night sky through video cameras. They want to use computers to connect to a telescope in Chile. They want to look at the stars on a screen. However, the immediate and unaltered experience of being out in the dark, of being in the ocean with sharks, of seeing a bear, is something very different from any simulation on a screen.

⁸ "Self-willed" in the original. A common and more or less metaphorical way of referring to wilderness among English-speaking conservationists is to call it "self-willed land". *N. of t.*

If you have no contact with a wild place, a wild animal or a wild process - and I mean experiential, corporeal contact - then why would you vote for environmental or conservation measures? This is a long-term problem for the US conservation movement. Certainly, there are still Sierra Club outings, Boy Scouts and Girl Scouts, and families who appreciate contact with nature, but when it comes to general population trends, things are not looking good. In Japan they have a word for people who don't leave their room: *hikikomori*. It is estimated that there are more than a million such people in Japan! This does not bode well for the natural world, not to mention the quality of life for these people. I am afraid there will come a day when people will not understand the writings of Thoreau and John Muir. They will be unintelligible to them. They just won't be able to grasp its meaning.

Tonino: I've heard scientists talk about the "shifting reference syndrome"⁹. If all the glaciers melt, then the normal will be a world without glaciers. In that case, when someone reads what Muir wrote about Alaska's glaciers—and his reverence for them—it will seem hard to understand and confusing.

Turner: Fisheries biologists also use that expression in reference to salmon populations. There is historical data showing salmon populations declining to almost zero size. Now that the salmon are "coming back" thanks to conservation efforts, people are celebrating: "We already have X number of salmon! Look how successful we've been! My God, the catches are fantastic!" Well, okay, but the number of salmon today is a tiny fraction of what it was a hundred years ago; and that was only a part of what existed a hundred years before.

The changing references have to do with our expectations. A famous saying of the mountaineers is: "Expectation is the mother of shit". If you expect something, you may well end up blind to what is actually happening. Take the famous gorilla experiment on the basketball court: psychologists ask a group of spectators to count the number of times each team bounces the ball.

These viewers are Outstanding Type people, competitive and committed to doing a job well done and accurate. The game begins and the spectators count the boats. As a guy dressed as a gorilla enters the court, he circles around and leaves. After the game, the psychologists ask the spectators: How many boats? And then they ask them: And what can you tell us about the gorilla? This experiment has been repeated multiple times and viewers always give the same answer: What gorilla? What we expect, what we are focused on, our background environment, and our traditions all radically affect our experience of what is "normal." At this very moment most human beings are blind to climate change and species loss – the new "normal".

Sometimes people come to Jackson Hole from New Jersey after making a lot of money in the stock market. They say, "My God, this is the most beautiful place in the world." I explain that the Snake River hasn't had a natural flow for almost a hundred years because it's dammed up and that hurts the insect population so now we don't

⁹ "Shifting baseline syndrome" in the original. *N. from t.*

have salmon flies anymore¹⁰. The locals used to describe them as blizzards - blizzards of salmon flies. And the absence of salmon flies has in turn impacted the size and health of the fish population; and that has had cascading effects on other animal populations. It is the difference between a healthy place and a beautiful place. Yet these people just look at me and say, "I'm not going to complain. It is certainly better than Hoboken¹¹." That is your reference.

Tonino: You have written: "We think we have come into contact with the wild¹², but this is an illusion. In both national parks and protected wilderness areas¹³, we accept a reduced category of experience, a semblance of wilderness, a fake; And no one complains."

Turner: Three years ago I gave a talk in Yosemite, and the area around the visitor center was so packed I've never seen anything like it, except in Calcutta. It was literally shoulder to shoulder. People arrive at the park by car, wander through the areas they've been funneled to, look at something without knowing what they're looking at - a ranger may try to explain it to them, they may read a description - and then they go back to their cars and they go. Most visitors to Grand Teton National Park never get out of their vehicles. Nature is a movie seen through the car windows. There is absolutely no intimacy with her. Intimacy always has to do with the body. It has to do with what you see, what you hear, what you smell, what you touch, what you taste. It's like sex: you can't have it abstractly. And you certainly can't be intimate with what passes you by outside the window of a moving car. In the best of cases, what you will have experienced is the landscape through the window, which is really not very different from looking at a screen. You can't smell a bear through the television. You cannot look a moose in the eye through a screen and know that he is looking directly at you. And you certainly don't have to worry about being *injured* by a moose.

In my youth I practiced a lot of free diving. One time I was ten feet down next to some undulating seagrass¹⁴ and suddenly it parted to reveal a five foot shark perched on the sand. That does something to your nervous system. It's the same as when you run into a bear in the wild. And you can have those experiences with people too. I once met a shadu [a Hindu holy man] high up in the Himalayas. It was falling sleet and snow heavily. He had a long beard and wore nothing but a loincloth. His eyes were huge! I greeted him. He nodded his head. I pointed to the camera on my chest, indicating that I would like to take a picture of it. He politely asked me in perfect English not to. I replied by saying something incredibly stupid: I asked him where he

¹⁰ "Salmon flies" in the original. Pteronarcyidae. Plecoptera family of insects from North America. *N. from t.*

¹¹ A city in New Jersey that is part of the New York metropolitan area. It is a very densely populated urban area. *N. from t.*

¹² "The wild" in the original. It refers to wild Nature, to wild things. *N. from t.*

¹³ "Wilderness areas" in the original. It refers to a type of areas protected by the "Wilderness Act" (Wild Spaces Act) in the United States. *N. from t.*

¹⁴ A genus of marine vascular plants. *N. from t.*

had learned English. He said, “From my parents; where did you learn english? *Whoop!* That guy was something else. Whether it’s with sharks, or bears, or sadhus, that kind of experience *Whoops* shakes your foundation in a way an iPad never could. It has to do with contact. As Thoreau wrote in *The Maine Woods*: “Contact! Contact!” You can’t get in touch through a screen.

Tonino: Can you tell me about the difference between the wilderness and the wilderness?¹⁵

Turner: Wildness is a quality; Wilderness is a place. I have never been interested in the “great wilderness debate”¹⁶, about what wilderness is¹⁷ and whether or not we have preserved it. Today they are divided into “real” wilderness areas and legally declared and protected wilderness areas. And when it comes to the latter, I’m in favor of anything that preserves what’s left of the natural world; And if the only way we can do that is by formally declaring those areas as protected wilderness areas, then that’s fine. Let’s do it—even if they’re tiny, strewn with old roads and tracks, devoid of dominant predators, subject to fire control and constant surveillance, and full of people carrying iPhones, iPads, and GPS. Personally, I’m interested in places that are remote, quiet except for natural sounds, and have good populations of wildlife and few people. I think it comes down to this in the end: Wilderness is places where you can go without running into other people.

Tonino: You have also written about the “requirement of measured idleness to become intimate with the natural world” and, elsewhere, you have also quoted the samurai adage: “Only the weak are in a hurry”. These are conflicting words in a culture obsessed with productivity and efficiency.

Turner: I think employee clock-in and clock-out cards and everything that follows from them are among the most pernicious things that have ever happened in the modern world. Techniques developed by Frederick Winslow Taylor, the father of scientific management, infected wildlife biology from its inception by emphasizing the importance of efficiency and data collection. Emphasis on these things to the exclusion of everything else is always a decline.

The New York Times, *The Wall Street Journal*, and *The Washington Post* have reported that Google has discovered that its employees are more productive if they really they stop and meditate from time to time. They have also reported that productivity drops in open offices. People *need* some degree of solitude, some privacy, some

¹⁵ Here it is impossible to translate the original question, “Can you talk about the difference between wildness and wilderness?” without losing much of its meaning. In English, the related but different (both refer to wildness) concepts of wilderness and wilderness are expressed by two similar words (“wildness” and “wilderness”, respectively), so many people sometimes Sometimes it even confuses them. Hence the interviewer’s question. *N. from t.*

¹⁶ “The great wilderness debate” in the original, is the expression used by a series of revisionist authors, mainly American, to pompously refer to their own postmodern critiques of the concept of wilderness and its preservation. *N. from t.*

¹⁷ “Wilderness” in the original. *N. from t.*

time to slow down. In our culture that is anathema. We are disturbed by the idleness of Thoreau and Muir, who were both censured for not working all the time. Thoreau's critique of the American way of life went much deeper than our chatter about late-capitalism and consumer culture. He would have felt much more at home among the Taoist hermits.

When I taught some courses at the University of Utah, I would take my class to a national park for eight hours straight. I asked my students to be completely silent during those eight hours. It was not formal meditation; we just walked for twenty-five minutes—slowly, moving very slowly, doing what Zen Buddhists call walking meditation—and then we sat for twenty-five minutes. Then we walked again. Finally, at the end, we wrote. Some students said it was like an explosion on the page. About a third of them liked it, a third showed moderate interest, and a third hated it. Some of the latter said that it was as if ants were running over them.

Getting people to slow down - young people, in particular - is important to me. I am not saying that anyone needs to meditate formally. A less loaded word is *contemplate* 17. What is happening in your life and in your relationships? Think about it. reflect. Most people no longer contemplate. They just keep going and going and going. All the luminaries of the American conservation movement - Thoreau, Muir, Aldo Leopold, Rachel Carson, Margaret and Olaus Murie, EO Wilson, and many others - spent much of their time alone on the seashore, or in a canoe on a lake, or in the forest, or in the mountains, or digging in the ground; and always in silence. I don't think the conservation movement is going to get anywhere if we have a citizenry that no longer wants to be alone and experience silence.

Tonino: Should we encourage everyone to get out in nature¹⁸¹⁹? Wouldn't they end up saturating it and destroying it?

Turner: Nowadays there's no need to cheer up most people. There was when Muir began guiding large groups of people into California's Sierra Nevada to familiarize them with the value of the wilderness. Now the value attributed to such areas is well known. The problem is that the people who go there don't care about the wild character²⁰; they care about the other human values of our culture: money, gadgets, family, friends, having a good time. Most people who go out into nature do so for recreation, not for contemplation. They use their beloved equipment - skis, fishing poles, backpacks, rafts - on the pitch of their choice. Many are in the nature business²¹, offering services to clients, often hordes of them, at thousands of dollars a package. These visitors do not

¹⁸ "Contemplate yourself, in the original. In English verb "to contemplate" refers exclusively to the following meaning of the Castilian verb "contemplate": Pay attention to something material or spiritual. That is, it refers to taking into account, considering, thinking or reflecting carefully about something or someone. *N. from t.*

¹⁹ "Wilderness" in the original. *N. from t.*

²⁰ "Wildness" in the original. *N. from t.*

²¹ "Wilderness business" in the original. *N. from t.*

have to face loneliness, existential fear, silence and the indifference of nature²², nor do they *contemplate* what these things mean for human life.

Tonino: In an essay on Vietnam veteran and bear expert Doug Peacock, you say that all explorers and globetrotters need "a mixture of danger and love." What do you mean by that?

Turner: If you don't have a passion or desire for exploration, then you probably won't take an unknown trail. If you do, your path will be treacherous, if only because you are unknown. Thoreau was against the State, but deep down his real enemy was conformity to what was known. The less conformity you have in your life, the more likely it is that your path will be dangerous. And I say: The more digital your life is, the more you will have conformed. It's safe to stay home, watch *Star Trek* reruns, mess around with Facebook, and follow digital gossip, but it's also shallow and lifeless.

Tonino: It strikes me that the best antidote to our aversion to nature may actually be to spend more time in nature, thus realizing that nature is not bad. It is actually something very simple.

Turner: There is no obstacle that prevents us from real contact with nature. Students sometimes tell me, "I want to experience wilderness²³, but I don't have money to go to Tibet. What should I do?" I tell them to grab a cheap pair of snowshoes and a plastic sled, drive up to the Tetons in the middle of winter, and head north eighty miles into Yellowstone, alone. If you do that, you will experience the wilderness in a really fast way. Sometimes some people ask me how to become a hermit. Look, the Escalante in Utah and many other places in the desert have great rock shelters. Look for a side canyon that branches into more side canyons. In many of them there is water running along the bottom. Live in the rock shelter. Drink that water. You don't need a store. I spent a week there. Nobody is going to bother you. No one will even know you are there.

It is important to note that there are many levels of loneliness. Thoreau was often not completely alone at Walden Pond. His cabin was just over an hour's walk from Concord. He wrote about the Irish workers who lived in cottages nearby. She went home in the afternoons to have tea with her sisters and to visit her mother. I was strolling the beaches of Cape Cod with a friend and going into the woods of Maine with Native American guides. The amount of time he spent in complete solitude was miniscule compared to the isolation of Taoist, Chan, and Tibetan hermits; and yet one can see how vital it was to the development of his thought.

When the British first visited Rongbuk Monastery on Everest's north face in 1924, they found 450 monks living there, plus hundreds of meditation caves, all at over sixteen thousand feet in one of the most hostile environments on earth. world. We don't have a hermitic tradition²⁴ like that in the United States. It is contrary to the puritanical

²² "The wild" in the original. *N. from t.*

²³ "Wilderness" in the original. *T.N.*

²⁴ "Hermetic" in the original. Looking at the context, it's probably an interviewer error and he actually meant to say "hermitic". It has been corrected in the text. *N. from t.*

spirit of work, work and work! You're supposed to spend your life working, not sitting in a cave. My conservation and environmental friends often chide me for championing wilderness and hermitage experiences²⁵. "And what about saving the world?" they say. "You should spend your time fighting climate change, saving wolves and redwoods, tweeting, blogging, and doing whatever you can." I answer with a very simple phrase: I believe that a hermit can live a perfectly good and full human life. People recoil from that answer. Puritan ethics and Taylor's ideals of management and efficiency are eating us up. Loneliness is seen as something to be feared, something that is not "productive."

Tonino: Reminds me of a quote from Edward Abbey: "It is not enough to fight for the land; even more important is to enjoy it. While you can. While it's still there."

Turner: In the first chapter of *Walden* Thoreau says, more or less: Don't be too nice. "If there is something that I regret, it is most likely my good behavior." And Abbey says that the problem with her environmental friends is that they are all obsessed with doing more in the fight for conservation. Too often this means giving up spending a week alone in the desert or going a week "fishing". The experience of the root is lost for the good of the branches, which eventually die.

In general, I think that non-profit environmental organizations are not very productive or successful. They take people's money, they fill out forms, they go to meetings, they write letters and they talk a lot. Trusting them involves many problems, as does directing environmental and conservation education towards them. At the University of Utah there was a student who wanted to spend her life defending wolves. I asked him how long he had spent with wolves. He told me he had never seen one. That is a problem.

I support non-profit environmental organizations that are doing something concrete. I love Earthjustice because they sue those who cause environmental damage. I support Greenpeace. However, I also hope that the people who work for those organizations do not lose perspective. I hope you'll spend some time out in the water with the whales and dolphins, hiking into the Yellowstone wilderness for a week every once in a while, preferably during a terrible storm.

Tonino: In your essay: "Wildness and the Defense of Nature"²⁶ you quote Lao Tzu: "The world is sacred. / Cannot be upgraded. / If you tamper with it, you'll ruin it. / If you treat it like an object, you will lose it." How do you reconcile the active defense of nature with the need to leave it alone?

Turner: There are many ways to act as a helpful partner with nature. One option is to start with the closest, with yourself and your own surroundings - right here and now - with your life and your community. I put bird feeders outside around my cabin in winter, not because the birds need them but because I need the birds. Very occasionally

²⁵ See previous footnote. *N. from t.*

²⁶ The author of the interview had written "Wilderness and the Defense of Nature," himself falling into the error noted in footnote 14. of this interview. The actual and correct title is "Wildness and the Defense of Nature." *N. from t.*

a chickadee²⁷ flies into the enclosed porch and gets trapped. I go in and catch the bird as gently as I can. Then I step outside, open my hands and let him go. This is one of the ends of the spectrum. From there you can go all the way up to more extreme ideas about controlling the weather. For example, Mark Lynas, author of the book *The GodSpecies*, now says that global warming has gone too far and that the only hope left for us to preserve habitable conditions on this planet is to actively manage the atmosphere, ocean acidification and the nitrogen cycle, and herding people into cities so they no longer live on land. Everyone living in cities? Nobody living in the country? It is creepy.

I like to pick berries. I like to pick mushrooms. I like fishing. I like to do these things as responsibly as I can, humbly, modestly, in the old Taoist way, seeking harmony as I understand it, not taking too much and not exerting too much influence. Human beings have interacted with nature for thousands of years, and for an enormous amount of that time, we got by relatively well. Then, gradually, we develop more power and more control. In my opinion some of the major environmental organizations have gone too far. They are really in favor of management, really in favor of manipulating cycles and complicated systems. I don't support that. I say, "keep things local, keep them close." Can you touch it? Can you smell it? Good. That is they are doing well.

I have tremendous mistrust of trying to turn things into a collection of experts shuffling numbers. Look what they did to the financial markets in 2008. Look what they did in the Iraq war. Look what they did in Vietnam. We have a significant case history of extremely bright, numbers-savvy, and technologically savvy people making terrible mistakes. So why entrust the land to them? I wouldn't trust them with anything at all.

Tonino: In your essay "The Abstract Wild: A Rant" you quote an officer in Vietnam explaining the destruction of a village by saying, "We had to destroy it to save it." Can this be applied to the scientific management of the natural world?

Turner: I think both wildlife biologists and conservation biologists in Yellowstone and Grand Teton and elsewhere are well-intentioned human beings. They have spent quite a bit of time outside in the natural world, and they really love it. But often both the way they interact with the natural world and what their jobs entail is intrusive. It sounds very nice to talk in the abstract about collaring animals with radio-tracking devices, but in practice it is very ugly. They drop nets on mountain sheep²⁸ from helicopters. The animals become hysterical. They run into avalanche zones and sometimes the avalanche falls and gets buried. They develop an incredible fear of helicopters and planes, so when they try to follow them, they disband and head back into avalanche zones. And these rams - or wolves or bears - are often caught not just once, but many times. And, of course, that also produces a certain mortality rate.

²⁷ "Chickadee" in the original. Refers to North American birds of the genus *Poecile*, which are similar to European tits (genus *Parus*). *N. from t.*

²⁸ Turner is probably referring to the "bighorn" or bighorn sheep of the Rockies, *Ovis canadensis*. *N. from t.*

There are few animal species in Grand Teton National Park that are not part of any management program. Everything is studied, everything is observed. The ravens are given collars. The fish are implanted with microchips. The studies raise questions that need to be answered. And then more animals need to be radiocollared. This kind of science feeds back on itself in a terrible loop. You end up having more and more biologists putting collars on more and more bugs. Numbers generate more numbers. The intrusion grows. And, anyway, who can process all that information? It forces us to use computers and create models that tell us how the world *should* be. Anyone who loves wild nature and wildlife should oppose all of this.

Tonino: Perhaps there is a feeling that if you are a nature lover, you have to jump on the bandwagon of this type of scientific management since there seems to be no other viable alternative. It's this or nothing.

Turner: The real problem is that nature lovers who want to get involved in ecology, biology and conservation are educated in this tradition. Look at any university's wildlife biology courses. What do the future managers of nature study? They study computer tracking. They study the use of radio collars. They analyze data. If someone says, "No, I want to be an old-school naturalist like Olaus Murie, go out with my binoculars and notebook and watch elk for ten years," then everyone will assure you that you're not going to get a job. The only way to get a field job is to participate in the continual growth of that intrusion, and many of those intruders are aware of this; and some feel pretty bad about it.

Cowboys have a great saying: "You can kick the courage out of a puppy. But it's very difficult to kick it back." We all know of dogs that are afraid of doing something wrong and getting kicked. The same goes for kids. One can completely crush a boy's courage. I don't want to take the soul out of the natural world. Once we take it from you, we cannot return it to you; we cannot manufacture courage and autonomy *a posteriori*. The wapití population of the Wapití National Refuge is considered the most intensively managed collection of animals in the world. They feed them with feed. They give them injections to keep them healthy. They house them in stables that are multi-million dollar mansions. And they still call them "savages"? From the moment we emerged as a species we have influenced the world; the problem is not the influence. The problem is a matter of degree: where do we draw the line when it comes to interfering with autonomy and self-organization? I believe that two human beings can be relatively autonomous and at the same time have a healthy relationship with each other. And I think this is the kind of relationship we need to have with the natural world: influence yes, but no control.

Tonino: We live in a time of great loss: fragmentation, destruction, extinction. On a personal level, how do you deal with these losses?

Turner: No one I know is naive enough to think we're going to "save the world". Regardless of what we do, the world moves on. In the end, politics and economics are not that important. However, that doesn't mean we should give up. I at least would like to go down fighting. It's not that Armageddon is coming; it is not the final call of

nature. Understanding by this a combination of radical climate change, war, famine and disease that could kill billions of people, but no one, no one! knows if it will happen. Water scarcity is already leading to water wars and refugees because of it. It is very difficult to predict the loss of species, since most research focuses on coral reefs or whales: flora and fauna that one can see and count. No one knows what is happening to the microorganisms in Jenny Lake, in Grand Teton National Park, or in the sky a mile above Maui. Not to mention threats to some of our finer pleasures, such as democracy.

How to deal with it? Keep it close. I help the chickadee out of the porch. I donate money to people who fight at the scale that best suits them. And I try to stay informed. However, I have lost faith in the typical liberal/progressive paradigm of conservation and environmentalism. The revolution needs us to go deeper than that; it lies in the realm of myth, of the religious or spiritual (a word I don't like).

Tonino: In some of your writings you have said that anger and indignation can be healthy.

Turner: I don't think anger is a bad thing. In fact, I'm suspicious of people who never get angry. If someone has never been angry, they have either never been upset or they don't have strong values. I just laugh at some people I know who call themselves pacifists in our very safe world. What would you do if someone came after your six-year-old daughter? You'd knock him down with a six-inch frying pan²⁹ and beat him to a pulp, that's what you'd do. Pacifism and civil disobedience are fine when one's opponent is also fine. The Nazis were no good.

Environmental issues can be abstract, but if you bring them close enough, down to the personal level, you'll be furious. It is a natural human emotion. I drove to California to talk about anger with my old Zen master, Robert Aitken. After chatting for a couple of hours, he showed me a photo of Yasutani Roshi, one of the first Buddhist teachers to come to America. Boy, did that have a fierce face - the guy was *scowling*! Aitken told me that Yasutani spent much of his life angry at Japan's Soto Zen hierarchy because he thought they had abandoned the roots of their own tradition. He was a wise and educated man - a good man - and he was pissed off.

Gandhi may have advocated nonviolent action, but if you think he wasn't pissed off, you're nuts. Martin Luther King Jr. was angry, too, and for good reason. There is nothing wrong with anger, but it must be directed toward productive action against an appropriate target. .

Tonino: In one of your essays you ask: "Do we want nature to be sacred? Can this be chosen? Should?" Can you talk about the complexities of calling nature "sacred"?

Turner: There was a time when the sacred was quite restricted. There were sacred objects. There were holy places to which people made pilgrimages. And there were more, many more, profane practices. Now the term has been so overused that it is no longer really distinctive. Most expressions have meaning because they are contrasted.

²⁹ Inch = 2.5cm approximately. *N. of the t.*

“The wild character”³⁰, “the wild nature”³¹, “the spiritual”; these expressions need to be contrasted with something. There comes a time when those kinds of words become like porridge. Dilute them too much and they won’t provide any nutrients.

Tonino: This brings to mind another of his essays, in which he calls himself a barbarian “in the original Greek sense of the term: one who has problems with the language of civilization.”

Turner: Just yesterday I saw an ad for electronic devices that said, “Upgrade Your Self.” What idea! “Make yourself better.” “Be a better you.” And what do you need for that instant transformation? Well, you’re going to have to buy a new pair of headphones and some other junk. The *self* movement in the United States brings in billions of dollars, yet no one has a clue what the word *self*[30³² means. Its meaning is discussed by psychologists, therapists, neuroscientists and marketers. But this does not stop anyone from using it to sell opportunistic electronic devices or books. Some words are overused, especially in the worlds of advertising and entertainment, to the point where they erode and dissolve. Do you really believe that buying headphones will improve your self?

Here’s another “spiritual practice”: “Pay two thousand dollars and you can spend a weekend at our little place outside of New York City. We will teach you to eat properly and to be silent, and of course you will have to buy a robe, special bowls and ivory chopsticks to eat with.” It’s the American way. Do you think that has something to do with the practice of Zen? Do you think that buying a Tibetan robe or hanging a *thangka* [Buddhist painting] in your apartment is going to make you a Tibetan monk? If so, you have been scammed.

what about the “wilderness”, that catchy expression? There has been a fight in California related to the Drakes Bay Oyster Company. For nearly eighty years they have farmed oysters in a bay that is within the Point Reyes National Coastal Park. Now the park wants to close the Drakes Bay Oyster Company and declare the bay part of a protected wilderness area. There are houses on a nearby hill. Commercial fishermen work in these waters just offshore. The bay is surrounded by dairy farms that have been there for decades. As if that weren’t enough, the species of oyster raised there is not native to the United States and has fundamentally changed the ecology of the bay. And they want to call it “wild area”? I think the expression “wilderness” nowadays is mainly political: we have to label places in a certain way in order to “save” them. It is another example of language erosion. We tend to use those labels that benefit our own political position or the sales we can make this weekend.

Tonino: You have written about the wilderness as a “project of the self”³³. What do you mean by that?

³⁰ “Wildness” in the original. *N. from t.*

³¹ “Wilderness” in the original. *N. from t.*

³² “Self” in the original. In English, the word “self” can mean “ego” or “I”, but also, used as a suffix or prefix, it means “one/oneself” or the same as the prefix “auto-” in Spanish. *N. from t.*

³³ “A project of the self” in the original. *N. from t.*

Turner: Well, since I don't know what "T" means anymore, I misrepresented myself. I take it back!

Really wild places allow one to sit quietly with few distractions, away from advertising, entertainment and the rest of the modern mind bombardment. I recommend going out into the wild for a week or two without bringing your music, your iPads, or even a book or journal. I call it "radical hermitism."

The mind's ability to generate noise is amazing. It soaks up information, thoughts, feelings. And if you deprive her of them, she will generate her own. In people who have just started doing retreats of some kind, the mind remains in a state of disorder for a while. However, if one perseveres, one calms down and "something" begins to settle.

On the expeditions I led, it was always the same story: rich people who had given me thousands of dollars to guide them on a 30-day trek to Everest or Annapurna would arrive in their Brooks Brothers coats and ties³⁴ -yes, back then they were mostly men- all very proud of their jobs, their prestige and their wives and children. Then we would start walking, and for two or three days their minds tossed and turned. These people who had flown to the other side of the planet to have a new and different experience trailed their lives behind them. Soon, however, they were having blisters and bouts of diarrhea and having to climb steep, snowy slopes. They had to get to know each other, and themselves. They adapted to the rhythm of the trip. After a month these people would admit, stunned, that they no longer thought about their jobs, their wives, their children. The main topics of conversation were their bodies, hunger, thirst, what they had seen, and the next mountain pass. As we neared the end of the expedition, all the old worries came back to the fore. These bearded guys who had been out there walking for five weeks and had forgotten about the "real world" would go back to their Kathmandu hotel, and immediately be immersed again in the buzz of it all, running on the hamster cage wheel : your phone, your computer, the columns of *The Wall Street Journal*.

A retreat does not have to be formal. It doesn't have to be "zen" or done in the harsher wilderness. Isolation, loneliness and silence can all allow us to contemplate the here and now. You are never going to get rid of your thoughts; that is not the goal. And there is no way to get rid of knee pain. Is here. Is near.

Tonino: I'm remembering your friends telling you that you should be saving the redwoods and writing "twits" instead of meditating in the woods. Why should we value a mind concerned with knee pain more than a mind focused on social and environmental issues?

Turner: I don't know how to respond to a total rejection: "I have no interest in contemplation. I am not interested in total isolation for seven days in the desert. I don't mind". If you don't care, you don't care. It's the same thing with people who say, "Am I supposed to care about giraffes? Really? Giraffes? And then they laugh at you and go back to typing numbers into their computers and transferring money

³⁴ American clothing brand. *N. from t.*

to Hong Kong. There is nothing to do with them. First of all they must experience doubt and glimpse a different need. People cannot be forced to abandon their values and traditions, their mortgages and alimony. As Zorba the Greek said: "Wife, house, children, everything - the total catastrophe".

Some guys are in the middle of total catastrophe and you go and tell them they need to spend more time alone in contemplation. What can they do? They just look at you with wide eyes. These people are nearly drowning; they are kicking as much as they can with their lips closed as the water seeps through their nostrils.

If you've never had a true wilderness experience³⁵, not even a reduced version of it, why should you be drawn to it? This is why it is so important for us who love wild places and wild animals - and what happens to our minds when we are in their presence - to do what we can to get people out there and to help them have those experiences. There are many ways to try.

Tonino: You have written: "Without great wilderness[602], I doubt that most of us will see ourselves as an integral part of nature". Where then are the children, the elderly, the disabled, and the people who can't even afford to pay for the fuel needed, let alone the free time, to reach the trailhead? Can we really practice seeing ourselves as an integral part of nature in our daily lives?

Turner: Expand your sense of wilderness³⁶. One of the easiest things is to go outside at night and look at the stars. Of course, if you live in the city, you won't be able to see the stars. I feel awful sorry for the dogs that live in a high-rise apartment in New York City, and I feel sorry for the people who live there too. However, the wilderness³⁷ is still within reach. They can drive fifty miles out of town and look up at the night sky, maybe get some binoculars and an astronomical map. Contemplate the fact that you are remnants of those stars. Contemplate the fact that the atmosphere through which you are looking is a wild space³⁸ with trillions of beings.

The necessary money is not required to go to Tibet. Central Park is pretty wild. Your backyard is wild. Go there and dig, or go back there with a microscope and watch the bugs that appear; little claws and jaws fighting each other and eating each other alive - the food chain in action. Thoreau watched the ants as they battled. They were right there, on the ground. He did not have to go to Tibet.

Ultimately it is a matter of choice. If you never take a moment to look at an ant, never go to Central Park, never put your hands on the ground, never stare up at the sky at night, never go to the ocean and stare at the waves; if all you do is stare at a screen for eighteen hours a day, then you're not going to understand it. If your child goes to gymnastics, swimming, dialectic, math classes month after month, year after year, without ever having a free moment, then your child won't understand it either. If

³⁵ "Wilderness" in the original. *N. from t.*

³⁶ "Wilderness" in the original. *N. from t.*

³⁷ "Wilderness" in the original. *N. from t.*

³⁸ "Wilderness" in the original. *N. from t.*

all you've done is study to get into law school, get married, and get your first mortgage, then you'll never make time for wilderness, big or small.

I can't tell you how important it was for many of the people I know who are lovers and defenders of the natural world to get in the car and go camping as a family. Those experiences mean a lot to the kids. They don't have to be anything fancy. All it takes is a little bit of intention. You can go out in nature with your children. You can hang out with old people. There are waterholes accessible to a wheelchair in the Yellowstone River. Exum Mountain Guides, I'm proud to say, has a program to take veterans climbing. Guys missing an arm, a leg, or an arm *and* a leg, peak at the Grand Teton.

There is a lovely essay, written by the poet Donald Hall a year or so ago, in *The New Yorker* in which he described the experience of looking out the back window of his house. He would sit there and look out, watching the birds and the snow. I contemplated. He could have been watching reruns of *I Love Lucy*³⁹ with the shades down, but he didn't. It is not a question of money. It really can be done. There is no logical barrier and there is no financial barrier. There are all kinds of ways to have contact with the natural world. It's just a matter of people *deciding* to do it or not. Instead they watch reruns of *ILove Lucy*.

³⁹ American television series that aired during the 1950s. *N. from t.*

Presentation of "THE VALUE OF A VERMIN"

Perhaps some readers may think that the following text lacks interest because it is focused on a very specific topic: the evolution of predator control throughout the 20th century in the United States. And maybe, to some extent, they are right. But, in any case, if one is perceptive enough, one can draw conclusions, implications and interesting ideas from it that are also applicable, saving distances, to other countries and other periods, and that go far beyond the specific issue of control of predators. This is the reason for publishing it.

As in many other issues related to the preservation of the wild, the United States was a pioneer in proposing seriously and in a more or less official way an ecological approach to the relationship between human beings and wild predators as opposed to the classic approach based on an anthropocentric and religious morality that demonized predators. This ecological approach to predation later spread to many other parts of the world, but it started there. And it is fair to know and recognize it.

However, the article also gives us a glimpse of the miseries of progressive thought (the so-called American "progressive movement" of the early 20th century was just one concrete example of the application of the general progressive ideal, that is, of the ideas based on the belief in progress): their humanistic arrogance, their malignant desire to defend and increase the "common good" (or of the nation), their objective focused on achieving absolute control, their ecological myopia, etc. And not only the miseries of official progressive thought (that of Pinchot and his henchmen), but also those of his rivals, some of whom were not even capable of really and emphatically confronting the basic values of progressivism and completely getting rid of them. . Thus they continued to defend the very idea of progress, the idea that civilization is a good thing, the idea of (natural) rights and the idea that industrial civilization is compatible with the defense and preservation of Nature and that both they can and should be reformed or improved; or the mistaken and silly idea of trying to extend a certain intrahuman "community" ethic to the relationship with other species or to relationships with Nature in general (the ecocentric ethic is and should be something very different from the moral extensionism of rights or the human community defended by Aldo Leopold).

In this sense, when the finger points to the Moon, the author, Donald Worster, stares at the finger. The limitations he sees in Leopold's way of thinking are merely secondary at best. For example, while Leopold's critique of laboratory technoscience

was on the right track, the fact that Leopold remained a scientist and a mechanist despite everything is not even a flaw. The problem of Leopold's ethics is not precisely a consequence of his scientific and rational mentality, but of a humanism and progressivism that he never managed to completely get rid of. Perhaps because he died prematurely - who knows what he would have thought had he lived on for a few more years?

Finally, as is customary among conservationist authors such as Worster, his writings are excessively steeped in idealism. Specifically, the idea that what is mainly needed to achieve the preservation of the wild is to spread a new ethic that regulates human behavior and makes it compatible and respectful with Nature. Something as praiseworthy as it is useless when it comes to obtaining practical results in that direction. No matter how much ecocentric ethics is preached and assumed, if the material conditions remain the same (expansion of industrial infrastructure and artificial environments, population growth, technological development, need for huge amounts of matter, energy and space, etc.), nothing will actually change, because it is these physical conditions that determine what we do with Nature. Billions of human beings living a techno-industrial way of life would continue to destroy and subjugate Nature anyway, no matter how ecocentric their ideas and intentions might be (which is not even the case). What is really needed most is to physically put an end to these material conditions, that is, to industrial civilization. Ethics and ecocentric ideas can and *should* be the inspiration and motive to combat techno-industrial society, but by themselves they cannot and will not change anything.

THE COURAGE OF A VERMIN

By Donald Worster

Out there in the American West, the howling wilderness is still howling, but the timbre and message of its voice have changed. During the 300 years of European colonization, the wolf dominated the natural areas[c]. He was a dark, green-eyed demon whose cry sent chills through the imagination of the American colonists - the symbol of a fierce and powerful nature that defied human domination. By the early twentieth century, however, that specter of evil had faded and the deep, gravelly song of the wolf was silenced throughout the United States, except in Alaska and in one or two isolated spots in northeastern Minnesota. . What remains to us today of this creepy world of carnivorous sound is the voice of that cunning and sly trickster: *Canis latrans*, El Coyote[d], the little "prairie wolf". His tenor wail echoes from a moonlit mesquite bush or sagebrush-covered hill and is answered by the barks and screeches of a few comrades, as if trying to fill the air now devoid of their voice. relative. An ancient Indian myth says that "brother coyote" will be the last animal left alive on earth, and in fact he has already outlived many of his old associates - the wolf, the cougar and the grizzly bear - as well as most of bison and pronghorn[e]. As long as the coyote roams

the earth, the wild[f] will continue to speak. However, it will do so with the voice of vigilante opportunism rather than fearless brute force.

[a] Translation by Último Reducto of “The Value of a Varmint”, chapter 13 of Donald Worster’s book *Nature’s Economy: A history of Ecological Ideas* (Cambridge University Press, 1985, pages 258- 290). © 1977, Donald Worster. *N. from t.*

b “Howling wilderness” in original. Expression from the Bible: Deuteronomy xxxii:10. *N. from t.*

[c] “Backcountry” in the original. *N. from t.*

[d] In Spanish in the original. *N. from t.*

[e] *Antilocapra americana*. *N. from t.*

[f] “Wilderness” in the original. “Wilderness” is a term that is impossible to translate exactly with a single Spanish term. It refers to areas where ecosystems are little or not at all humanized, that is, “wild areas (or lands).” In this text it has been translated in different ways depending on the case.

Ernest Thompson Seton and Vernon Bailey estimated that the wolf’s original range in North America was seven million square miles[g]. Before the arrival of the white man there were about two million wolves in this area - one for every three and a half square miles. By 1908 the wolf population had fallen to 200,000 individuals, and only 2,000 of these lived west of the Mississippi, in what was once their stronghold. In 1926 in Arizona it was reported that there were no wolves left there and in Wyoming only five could be found. Two years later, out of tens of thousands of carnivores killed in western states, only eleven were classified as gray wolves[h]. In 1929 the report of the federal office for the control of predators did not even mention the species. Neither do mountain lions[542]. Not grizzly bears[j]. The body count showed that almost all of them were coyotes, along with a few badgers, bobcats[k], foxes, and skunks[l].

Continuing to deliver the message of the wild[m] seems like a heavy load for a creature as small as the coyote, but so far it’s done pretty well. It has expanded its range from the prairies and plains to Point Barrow, Alaska, through New England and the Hollywood Hills. However, over the years he too has lost some ground. In vast swathes of Texas, Wyoming, Nevada, and Idaho, for example, the nights are deadly silent—these are places where the coyote once cavorted and sang but is now no longer heard or seen. It seems that ingenuity and courage have not always been enough to save him from the fate of the wolf. It has been equally hunted, but with increasingly powerful technological weapons: cyanide guns[n] (the “coyote catcher”), snipers from airplanes with high-powered rifles, sheep carcasses or deer poisoned with sodium fluoroacetate-known popularly called Compound 1080, one of the deadliest poisons ever made; a single pound[or] of it is enough to kill a million pounds of animal life. In recent times, in the United States, at least 90,000 coyotes have been killed each year using these means; from 1915 to 1947 almost two million copies were exterminated. Clearly, for all his successes, the coyote hasn’t had it easy. It has not been feared as the wolf was,

but it has been hated, despised and relentlessly persecuted by the white man perhaps more than any other animal.¹

The coyote is the vermin par excellence. Unlike his other relative, the servile domestic dog, he keeps a safe distance from man and, as if this were not enough, he attacks the farmer's chickens or the shepherd's lambs. Of course, only on a domesticated world could he be reduced to marauder status in this way; in nature's amoral economy it is simply a predator, living, at least in part, by hunting for its meat rather than a more innocent diet of grass-eating. However, with the advent of the agricultural economy in the New World, it inevitably became an outcast and an elusive challenger to the controlling and industrious hand of man. Even more than that, he ended up being seen as a moral transgressor, a sinner, a kind of "plague" that had to be eradicated, by any means available. It may be true, as J. Frank Dobie believed, that "sympathy for wild animals, sympathy that is both intellectual and emotional, has not been a particularly strong element in the traditional American way of life." However, we have made distinctions in our national responses to wildlife, picking favorites and picking enemies. Here, as with other issues, the Anglo-American mentality has exhibited a peculiarly intense moralism which, in this case, assigns to each species an absolute ethical category: good or bad. A few wild animals, mainly songbirds, have been declared good; all the others are only good for target practice. And "vermin" has been the worst of all epithets in the American moral lexicon, a label reserved for those species that dwelled in the depths of moral turpitude. Basically vermin are animals with teeth and claws: carnivores, including wolves, mountain lions, bears, and, at the end of the line, coyotes. Since the time the Puritans of New England first put a price on their heads, carnivores have been viewed more often than not as implacable, diabolical enemies deserving of nothing but total extermination. Hence laws such as that of Vermont that considered a crime comparable to rape or robbery to hinder the trapping of wolves. Hence this damning description of the cornering and shooting death of a cougar on the rim of the Grand Canyon by Theodore Roosevelt: "The great horse-killing cat, the deer destroyer, the stealthy crime lord met his doom with a heart. as cowardly as cruel". As the last representative of these "outlaws," the coyote has been the object of concentrated moralistic fervor in the United States, and its tenacious survival represents an outrageous challenge to man's just rule over nature.²

However, in the 20th century, the coyote, along with other vermin and predators, has come to be viewed by many Americans in a radically different light. Some have seen him not as an outlaw but as a useful member of the biological community; in fact, their individual well-being has come to be identified with the well-being of the ecological order as a whole. The absence of predators means a badly unbalanced natural economy; a world without coyotes, wolves or pumas, it has been claimed, is a world in

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

trouble. Seen from this perspective, the presence of a vermin is a reaffirmation not only of the survival of wild nature, but of environmental health in general. And a society that insists on the total extermination of predators and other unwanted species, and puts its own inventions in their place, has more self-confidence—perhaps more self-indulgence—than it can justify.

In other words, this new vermin defense has an ecological nature. It stands at the very center of the shift that has occurred in twentieth-century environmental thought toward a broader popular ecological consciousness. Like the idea of the climactic community, which gained public attention around the same time—during the 1930s—predator advocacy was led by a group of professional ecologists. However, they were eager to teach the public both ethical values and the principles of their science alike. The story of the change in the vermin's reputation is thus the story of the movement in American conservation toward an ecological point of view: an attitude grounded not only in science but in a moral philosophy of interdependence and tolerance.

Much has been written about how the rise of the conservation movement in the United States ended an era of waste, greed, and overexploitation on the frontier[p]; how he saved forests and wildlife for generations to come. Conservation has often been hailed as one of the greatest contributions made by the United States to reform movements around the world, with its ideas eventually being exported to Britain and other nations. All this is true; in some way. What is generally left out of this interpretation is that, for several decades, a major feature of the resource conservation crusade was a deliberate campaign to destroy wild animals - one of the most efficient, well-organized, and well-financed enterprises in history. history of mankind. This destruction was by no means accidental; it was a clearly stated policy of certain leading conservationists and a central goal of the government programs they established and directed. It was this policy that killed the wolf in the early years of the century, and it is this same ideal of conservation that has promoted, and continues to promote, the war against the coyote.

When conservation came to national prominence and fixed its purposes in the minds of the public, it was one of the main expressions of the progressive political movement[q]. Progressivism was primarily a reformist campaign to clean up politics, regulate the business of large corporations, and purify the nation's morals. Yet another important goal of his program was more effective management of natural resources in the public domain. One of the main spokesmen for this effort was Theodore Roosevelt, president of the United States from 1901 to 1909. From his administration - and more broadly, from progressive ideology - also emerged an official program to eradicate vermin and protect the United States from its depredations. In a way, there wasn't much new in this progressive conservation; Nature continued to be valued primarily as a commodity intended to be used for the economic success of man. However, vastly more effective means were offered for putting the old attitudes into practice. For the first time, the resources of the federal government were applied against predators. Rather than rely on the vermin-hunting frontiersman, the government itself set about eliminating the predator once and for all.[544][545]

The agency entrusted with carrying out this mission was the Office for Biological Study[r][OEB] of the Department of Agriculture. Founded in 1905, the OEB had a number of predecessors dating back to the 1880s, including the former Division of Entomology and the Division of Economic Ornithology and Mammalogy. Throughout this process of bureaucratic change, the element that remained constant was the man who served as director in all the agencies: C. Hart Merriam, creator of the concept of “vital zone”³ and a authority on the feeding habits of birds and how they posed a threat to crops. For many years of Merriam’s tenure, the agencies’ work consisted of little more than amassing a staggering collection of 25,000 bird stomachs; his true ambition, however, was more purely scientific. Before he resigned, he managed to get the word “economic” removed from his agency’s name and made it a more disinterested body, primarily concerned with the geographic distribution of wildlife. However, the OEB, like its counterpart the United States Geological Survey[t], never strayed too far from its practical leanings. In 1901, for example, Merriam turned from the problem of controlling bird pests to that of the abundance of mammals, specifically prairie dogs[u]. The remedy, he claimed, was to use poisoned grain. Ranchers had long used various poisons to kill wolves, but Merriam appears to have been the first federal official to publicly recommend poisoning an animal. Following Merriam’s departure, the OEB began to focus its energies even more on aspects of science that have obvious economic value. Congressional pressure to produce results - that familiar nemesis of government-sponsored science - helped prod the agency toward a more active concern for the nation’s well-being, especially the economic plight of farmers. By then, agriculture was already something very different from the world of the simple rural farmer who tilled the land to feed his family. It was a big business, serving huge international markets, and some people in the government suspected that it was losing a considerable part of its annual profits to wild animals. Consequently, in 1906 the OEB began to function as an information center for state reward systems[547][548][549][550][551]. He intensified his work against damage caused by insects in crops. And he began publishing pamphlets on the habits of predators, suggesting the best types of scent baits and poisons to use against each species. In 1907 the Bureau oversaw the culling of 1,800 wolves and 23,000 coyotes in the National Forests[w], a policy that soon extended to the National Parks as well.⁴

Then, in 1915, the OEB began to become even more directly involved in what Jenks Cameron calls “the suppressive war” against the unsavory types. The reward system, after nearly three centuries of trying, had proven not to be effective enough in clearing the land of pests and vermin; what was needed, the OEB agents decided, was

³ “Life zones” in the original. *N. from t.*

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

a relentless campaign by specially trained forces of government hunters, trappers, and poisoners. Congress that year appropriated \$125,000 for this professional army to carry out the extermination of wolves on both private and public lands: it was the beginning of the end for several species. In 1931, three quarters of the Bureau's budget went to the predator control program. In the early 1940s, almost \$3 million a year was spent to eradicate predators and rodents; in 1971, the combined federal-state cooperative extermination program, run by the recently renamed Wildlife Services Division⁵ of the Bureau of Game Fish and Wildlife[and] the Department of

Interior, had assigned 8 million dollars. The names changed every few years, as they often do in government bureaucracies. Budgets were constantly growing. And many predators were inexorably pushed into the abyss of extinction.⁶

This course of events occurred in part because pressure on the government from powerful ranchers' associations, especially those of western sheep farmers, many of whom reacted with an almost metaphysical hatred of wolves. and coyotes. His sheep were tragically vulnerable animals, hard to raise and hard to protect from a thousand and one possible mishaps; however, the livelihood of their families depended entirely on the safety of these woolly cattle. The large scale of many livestock farms made their situation even worse, as it greatly exceeded the herders' ability to supervise and care for all the sheep. Instead of herding their herds into secure pens, following the ancient tradition of good shepherds, western ranchers, living on sparsely vegetated land, began letting them loose on public lands. Ranchers then petitioned the government to clear the land of potential dangers. They wanted—needed, in their view—to see the West turned into an artificial ecological order, forever free of predators: an idyllic pasture for thousands of frolicking herds. This desire was accurately translated into the policies carried out by the federal predator program. In fact, the West quickly became safe for sheep and profitable for sheepherders, at least until after World War II, when falling markets—not coyotes—reduced sheep numbers. raised in the United States to almost half of the total existing in 1910. Reported losses, which according to statistics reached \$20 million a year, made it seem that it was in the best interest of the national economy to support the industry. sheepdog with an army of trappers. By the early 1960s, however, it was impossible to show that losses were large enough to justify continued predator control: in 1962, for example, the value of lost sheep on California National Forest land was 3,500 dollars, while the control program on those same lands cost more than 90,000 dollars. After half a century of being protected, ranchers suddenly found themselves on the defensive, forced to accept an end to poisoning on public lands. In the meantime, however, they had gotten rid of several million vermin in their grazing areas.⁷

⁵ "Wildlife Services Division" in the original. *N. from t.*

⁶ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁷ A couple of examples:

However, the war without truce to exterminate the predators was more than the result of economic necessity and political pressure from groups of ranchers. The most important force at play was the attitude toward the land and wildlife advocated by progressive conservation leaders. These men were motivated by a powerful and highly moralistic sense that they had a mission to clean up the world around them, and that ambition affected both the natural environment and economic and political corruption. Without his example of moral zeal, the OEB could have simply continued collecting stomachs and mapping vital zones. Instead, during Theodore Roosevelt's years in office, the Bureau began to echo his aggressive reformist philosophy. Perhaps progressive rhetoric criticizing "predatory capitalism" helped Bureau agents support a war against predatory animals in the West, and even aggressively try to sell the idea to many reluctant Westerners. nature, like

[and] "Bureau of Sport Fisheries and Wildlife" in the original. *N. society, it was claimed, harbors ruthless exploiters and criminals who must be wiped off the face of the earth. Pamphlets began to appear, such as Vernon Bailey's "Destruction of Wolves and Coyotes"[z] in 1908, emphasizing the economic losses caused by these animals and describing them as diabolical and cowardly monsters; photographs showed them with their legs outstretched, their heads lowered, their eyes ablaze with cruel cunning. This crusade by conservation leaders in government was not merely intended to support a powerful cattle industry. Far more important was his desire to establish a philosophy of wildlife management in which utility and morality were closely linked goals. According to both perspectives, the predator was therefore persona non grata. The plan, explains Jenks Cameron, was "first, the suppression of undesirable and harmful wildlife; second, the protection and promotion of wild fauna in its desirable and beneficial forms". These conservationists were dedicated to reorganizing the natural economy to meet their own ideal vision of what nature should be.[553]*

The main architect of progressive conservationist ideology was Gifford Pinchot, a Pennsylvanian who served as Chief Forester under Roosevelt and who in 1905 organized the United States Forest Service. In his autobiography, *Breaking New Ground*, Pinchot defines conservation as "the fundamental material policy of human civilization" and also as "the development and use of the land and all its resources to maintain the well-being of the men". How the nation would achieve complete and lasting prosperity was the problem that dominated his entire public career. There was no man in Washington who was less selfish than he or more dedicated to improving the nation's welfare, both morally and economically. There is also no doubt about his utilitarian bias towards nature. Prosperity, Pinchot asserted, could never be guaranteed in a society that squanders its natural wealth in the traditional frontier style of arrive, fleece and leave. On the contrary, a long-term plan was required, careful management based on a totally rational and efficient exploitation of resources. The goals of such management would not be private profits or an even greater concentration of wealth, but the maximum economic benefit for all citizens. In 1897 the National Forestry Commission[aa], of which Pinchot was a member, concluded in a report that the vast tracts of public

land remaining in the United States, all of it in the West, should not be completely protected from future occupations or uses. "They must be made to play their part in the Nation's economy. Unless protected lands in the public domain are made to contribute to the well-being and prosperity of the country, they should be opened up to colonization and the entire system of protected lands should be abandoned." Pinchot agreed with all this, but especially with the emphasis on the priority of the "economy of the Nation." Protecting the nation's economy, not nature's, was the central theme of his conservation philosophy. He shaped the Forest Service and ran it with that goal in mind, leading a body of young men who combined a pragmatic business sense with a fervent commitment to their patriotic cause.[554]

Pinchot liked to refer to forest conservation as "tree farming." [bb] Instead of simply extracting wood from the forests, his forestry corps would replant the cleared land, just as a farmer replants his crops each year. "Forestry is managing the trees so that they give one harvest after another," he explained.

The purpose of Forestry, therefore, is to cause the forest to produce as much as possible of whatever crops or services are most useful, and to continue to produce it generation after generation, both of men and trees ... a farm well managed, it becomes more and more productive as the years go by. The same is true of a well-managed forest.

Like Francis Bacon or Lester Ward [cc], Pinchot believed that the world desperately needed to be managed, and he was convinced that science could teach man to improve nature, to make its processes more efficient and that its harvests were more abundant. He would not go as far as the Germans in intensive farming, nor in setting up, as they did, tree farms whose orderly planning reminded one of factories - there was not enough labor in the United States to manage nature so intensively on their own. such a vast expanse of land. However, I would insist that in the future all renewable natural resources, especially forests and wildlife, be seen as crops that should be planted, cultivated and harvested by qualified experts. And like any good American farmer, he could see value in land primarily where it could be made profitable.[555]

Behind Pinchot's philosophy of conservation, there is a whole tradition that dates back to the 18th century: progressive and scientific agriculture. Since the time of "Turnip" Townshend [dd] and Arthur Young [ee], who taught England how to make two blades of grass grow where once only one blade grew, progressive agriculture had always promoted some form of conservation. Their spokespersons have long been a force for water and forest management. They had shown previous generations the threat of soil erosion, developed contour cultivation, and invented chemical fertilizers to make the land more productive. In the United States they had established a series of agricultural colleges where students were taught the gospel of wise land use [ff]. Thus, when Pinchot announced that he was "innovating" in the field of conservation, he was overlooking two centuries of pioneering work. More specifically, his own contribution would bring the tradition of progressive agriculture to the management of *public* lands, especially forests. Like his predecessors, he made improving "efficiency" and "productivity" the

values that controlled conservation. These words, in fact, became sacred symbols for him, imbued with powerful magic that could transform tree stumps into paragons of beauty and virtue. Just as the progressive farmer enjoyed seeing the rows of plowed fields contoured and the fences stretching steadily beyond the horizon, Pinchot liked to see his well-tended trees, their tops developing properly and their competitors removed. It is therefore not surprising that the Forest Service found its final home in the Department of Agriculture, which was dominated by experts in agronomy and productivity.

Essentially, the goal of progressive conservation was to apply progressive farming techniques to all land in the United States that fell within the administrative domain of the federal government.

In the history of progressive agriculture, wild creatures have never been given much thought. They did not suit the farmer's productive purposes and were therefore seen as useless, if not threatening. However, there were at least a few farmers who had pointed out the beneficial role birds played in controlling insect damage, and there were even some who had argued for a more ecologically sensitive farm economy. In the United States, for example, there was John Lorain, who in 1825 published his *Nature and Reason Harmonized in the Practice of Husbandry*. Specifically, Lorain criticized farmers for destroying the way nature created soil fertility through the accumulation of humus and the work of "animalcules" or bacterial decomposers. Henry Thoreau's 1860 essay on "The Succession of Forest Trees"[gg] was a contribution to both ecology and scientific agriculture. And then in 1864 George Perkins Marsh, a Vermont country man who became the American ambassador to Italy, wrote his *Man and Nature*, the most extensive work on land management ever written. until then in the English-speaking world. Marsh spoke from both his own experiences and close observations of New England agriculture and from his extensive reading of the works of European naturalists, geographers, foresters, and hydrologists. "The equation of animal and vegetable life", he warned, "is a problem too complicated for human intelligence to solve, and we will never know how wide the circle of disturbance that we produce in the harmonies of nature will be. when we throw even the smallest pebble into the ocean of organic life." Where wildlife was concerned, he advised the farmer to err on the side of caution rather than risk eradicating species that might turn out to be a boon after all.

However, Marsh's perspective on land use differed from that of Gifford Pinchot a few decades later. In fact, the conservation program that emerged under Pinchot in the early 20th century paid little attention to ecological complications. It was essentially a program aimed at maximizing the productivity of the major resources in which man had a clear, direct, and immediate interest. If an abundant and lasting supply of trees was wanted, that, and not the preservation of the much more biologically complex matrix in which the trees grew, became the sole goal of the forester. This strategy, it must be said, had always been the main tendency of scientific agriculture and was easily inherited by the way of thinking of its descendants: conservation.[556]

Pinchot himself seems to have shown little interest in wildlife, except as a hunter who liked to pick up a trophy from time to time hunting alongside his boss, Theodore Roosevelt. Other conservationists, however, found Pinchot's tree-growing program an inspiration to do the same for birds, fish, and mammals; they wanted to create the profession of "hunting manager". It was this group that launched the OEB and dozens of new state programs for wildlife management at the turn of the century. Like the primeval forests, huntable wild animal species had been completely exterminated in many areas of the country in the 1980s. The hope of conservationists was to bring these species back into sustained production so that they could play a role, if not in the nation's economy, then at least in its entertainment. With deer in particular, they focused their visions on future abundance. With judicious management, this animal could survive the impact of civilization better than any other, providing the hunter with a taste of the challenges of frontier life. It was "big game" in a world that was otherwise dwarfed. Consequently, game conservation came to mean an intensive attempt to increase the deer herd across the country by requiring hunters to be licensed, limiting catches, establishing more restricted hunting seasons, improving habitats, and providing "refuges," and "game reserves" in which a population serving as a source could be kept in good condition. And it had to mean, most emphatically, destroying the predators, who were after all man's rivals for the experience of killing and meat. The predators were "wasting" a resource that could produce benefits. And their crimes against livestock made them unacceptable to a profit-oriented society. In short, there was nothing in them worth keeping.⁸

Game management on public lands began in earnest during the Roosevelt administration. To begin with, in 1905, certain parts of a few National Forests were declared refuges and predators were eliminated as quickly as possible. This management policy soon began to bear fruit. On the northern Arizona plateau, for example, in the Kaibab Forest area declared a Grand Canyon National Game Reserve, there were only 4,000 deer in 1906. Eighteen years later their numbers had grown to nearly 100,000. It appeared as a magnificent curve in the production studios, a stunning triumph of progressive game conservation. Suddenly, however, the following year, thousands of deer died from malnutrition; the population explosion had led to the deer grazing and browsing the trees excessively (eating the twigs and leaves of the branches as high as they could reach). According to Irvin Rasmussen, "the area had been so severely damaged that even 20,000 was an excessive population." Sixty percent of the total population disappeared during the winters of 1924-1925 and 1925-1926; by 1939 the Kaibab deer population had dropped to just 10,000 animals due to starvation and hunting. Since then, the Arizona episode has become the *cause célèbre* of game management in the United States. It has been held up for half a century as the

⁸ For example: "*In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*" (*Earth's Revenge*, page 166).

classic example of corporate-style resource mismanagement and ecological ignorance by production-focused conservationists. However, in 1906 none of this was foreseen by hunting specialists. Even as late as 1918, when the damage to habitats caused by excess deer began to be recognized by some foresters, no official action was taken to change the policy of cultivating a single resource in the landscape.⁹

Deer are a species that fit too well into the 18th century model of nature. Unlike some creatures, they seem to have no ability to control their own proliferation, and generally require some kind of outside force to keep their numbers in balance with the habitat. Perhaps many factors played a role in the Kaibab explosion, but undoubtedly the lack of control by predators was the most important. Between 1906 and 1923 government hunters patrolled the area, killing any predators they encountered and, as usual, doing their job with deadly meticulousness. During the period from 1916 to 1931, they trapped or shot 781 mountain lions, 30 wolves, 4,889 coyotes, and 554 bobcats. As late as 1939 they were still carrying on their mission, despite the ecological disaster they had previously caused. Once instituted, it was argued, a management program could not be abruptly terminated; In their weakened state, deer needed protection from their enemies more than ever. On the other hand, by then it was widely understood that the earth could not support an unlimited abundance of “desirable” wildlife resources. Everyone already agreed that the deer had to be kept within the carrying capacity of the environment. But this was a job that human hunters could do as well as the missing predators, and they were only too willing to take it on. Thus a new human-made ecological order was born, both on the Kaibab Plateau and in the rest of the United States - an ecological order designed and created by wildlife managers and requiring their perpetual oversight.¹⁰

During this early period of wildlife management, the Department of Agriculture had nothing comparable to Gifford Pinchot’s forestry leadership. The Kaibab episode was more the product of a loose set of assumptions than the ideas of a prominent leader. However, in 1933 a book appeared that would soon become the bible of the wildlife management profession: *Game Management* [hh] by Aldo Leopold. Leopold’s work was both the foundation of this emerging scientific field and the culmination of all progressive environmental philosophy. Leopold had studied at the Yale Forestry School, created with money from the Pinchot family in 1900 and since then recognized as the leading academic center for the productive view of nature. After a period of work in New Mexico and Arizona, promoting game management more than forestry, Leopold moved in 1924 to Madison, Wisconsin, to work as associate director of the United States Forest Products Laboratory. Again, his interest in wildlife proved stronger than his commitment to the Forest Service, and in 1928, with financial help from the Institute of Sporting Arms and Ammunition Manufacturers, he began to study the status of game animals in the area. northern Midwest. In 1933 he assumed the new chair of game

⁹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹⁰ Examples:

management at the University of Wisconsin - teaching his courses in the Department of Agricultural Economics, not surprisingly.

Like the foresters, Leopold believed in extending the principles of scientific agriculture to broader management of nature. "Effective conservation," he said, "requires, in addition to public sentiments and laws, a deliberate and determined manipulation of the environment - the same manipulation that is carried out in forestry." He considered that highly prized species such as deer or quail¹¹ were nature's "crops" that should be cared for and harvested. This agronomic perspective was the essence of his conservation program in 1933, just as it had been for Pinchot three decades earlier.¹²

In *Game Management*, Leopold further articulated this idea of nature as "resources"—a world that had to be reorganized and managed to meet social demands. The purpose of management, he explained, is to alter the environment "to obtain greater productivity," which in this case would be "the rate at which a mature reproductive population produces more livestock or mature harvestable crops." "Like all other agricultural arts," he went on to say, "hunting management produces a harvest by controlling environmental factors that slow down the natural increase, or productivity, of breeding animals." Much of that book, therefore, was devoted to identifying these limiting factors with mathematical precision.

Scientists see that, in order to economically manipulate the factors of productivity, they must first discover and understand them; that the task of science is not only to provide biological data, but also to develop a new technique based on it.

For the wildlife expert, science was a tool to extract greater harvests from the field. Leopold, all told, not only calculated the value of game animals in dollars and cents; to him they also represented a primitive, pioneering past in which he hoped the average citizen, through hunting, would continue to believe. For this reason he insisted that the hand of management must touch the natural order gently—not tear it to pieces and then put it back together in too obviously artificial an order, but subtly direct its forces to keep prey alive, alert, and evasive. Yet despite his attempts at naturalism in handling the land and his ideal of a low-intensity, rustic management style, Leopold did not stray too far from the well-trodden agronomic path. Like any modern Wisconsin

¹¹ "Quail" in the original. This English term generally refers to small birds belonging to the order Galliformes that are often appreciated as game prey, not only to quail proper (genus *Coturnix*). *N. from t.*

¹² Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

farmer, his ambition in *Game Management* was to make the land more productive. Consequently, his book stressed the economic approach to nature.¹³

Apparently, the experience of the Kaibab reservation did not shake Leopold's confidence that the progressive environmental position was basically correct. He continued with the campaign against predators, and continued to promote the control of their troops as one of the most effective methods of hunting management. However, it had considerably softened his once fierce resentment of the presence of carnivores in nature. In 1920, for example, he had vowed to persevere until "the last wolf or mountain lion in New Mexico" was dead. Five years later he had begun to express himself in a slightly different tone; at least he had begun to question whether a policy of total extermination was really sensible, from an ecological rather than an economic point of view. However, his answer to that question took a long time; it would be another ten years before it grew large enough to shatter the foundations of his professional conceits. In a sense, therefore, *Game Management* was an anachronism, both for Leopold personally and even more so for some other conservationists. A few people, more influenced than Leopold by the Kaibab failure, were already ahead of him when it came to wondering if it might not be good to have predators around sometimes. They began to question whether productivity and efficiency were the only important values in man's relationship with nature, and to question agriculture's "crop and harvest" bias in conservation and its unwavering human-centered perspective. They began to worry - as did Leopold at times - about the ecological consequences of progressive management. And they were moving towards a different set of moral values when it came to nature.

For the most part the agronomic mentality held firm and the war against the coyote and other vermin continued without restraint. But in the mid-twentieth century, an ecological stance toward wildlife began to emerge in the United States. Leopold was quite slow to get on board with this new attitude; but when he did, he displayed an eloquence and credibility that quickly made him one of the leaders of the new ecological current. While many students were still absorbing Pinchot's lessons through *Game Management*, Leopold himself was already attacking much of what the old school of conservation had stood for. To fully understand Leopold's conversion and the broader movement it represented, it is necessary to examine the early signs of dissent, to follow those cracks in the wall as they spread across established environmental values.¹⁴

There were undoubtedly many ordinary people who never agreed with the conservation ideology and its policy of exterminating predators. And there were eloquent and highly visible dissenters like John Muir, founder of the Sierra Club, who until the end of his life, in 1914, opposed Pinchot's philosophy with a fierce and uncompromising

¹³ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁴ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

passion. However, the first notable criticism of the OEB and hunting specialists on the specific issue of vermin came with the annual meeting of the American Society of Mammalogists in Philadelphia in 1923. Several scientists, including Joseph Grinnell of the University of California, were alarmed by the disappearance of predatory mammals in the United States and by the methods used to eliminate them. The Office, they pointed out, was focused on a "modern toxic war" without carrying out hardly any studies about its environmental consequences. Possibly the widespread revulsion towards the use of poison gas on the battlefields of the First World War influenced this criticism. However, the reaction of many zoologists against poisoning was not diluted along with their memories of the Great War. At the 1923 meeting and for more than a quarter century afterward, the Society would hear at its annual conferences reports from critics of predator eradication, along with defenses of it from its apologists in government and industry. livestock.¹⁵

In April 1924, for example, Charles C. Adams, one of the nation's leading wildlife ecologists, spoke on "The Conservation of Predatory Mammals" at the Society's annual meeting. In 1925 the *Journal of Mammalogy* began publishing articles for and against the Bureau's predator program. In 1930 the Society organized a "Symposium on the Control of Predatory Animals" for its May meeting at the Museum of Natural History in New York City. Speakers included WC Henderson, associate chief of the OEB, and EA Goldman, the Bureau's expert biologist, as well as CC Adams, representing the New York State Museum in Albany, E. Raymond Hall, and Joseph Dixon of the University of California and A. Brazier Howell of Johns Hopkins - all critical of the government's extermination policy. During the 1930s the Society-created Mammalian Predator Control Problem Commission sent scientists along with Bureau agents into the field to conduct joint investigations of government hunters and trappers and to report the harmful effects of poisoning, both for the species under control and for the others. And as late as 1950, when the Society of Mammalogists met in Yellowstone National Park, they were still voting and passing resolutions critical of Washington's policies on predators. "Our destruction technologies are adequate, what we need are techniques to successfully live in association with our native fauna and flora," they concluded at this conference.

This statement is the essence of the dissenting position of scientists throughout that time of controversy.

During this period, between 1925 and 1950, the Mammalogical Society was the Office's main institutional opponent. However, individual scientists, and non-scientists

¹⁵ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "Like photosynthesizers[*], we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

as well, joined in the search for a new relationship between man and predator. Still, there were scientists in the Society, some of them working for the OEB, who defended the mass poisoning campaign. So it was not simply a confrontation between science and government that was emerging, but rather a clash between contradictory ethics in relation to nature, each of which presented science as its valid authority. To be sure, much of the debate centered on rival claims about economic prudence, technical disputes over population dynamics, and accusations of conflating vested interests with scientific issues. However, the fundamental point of disagreement revolved, as usual, around moral values - in particular about man's place in the natural world, and his rights as one species among many others. The "ecological point of view" became the watchword of critics of the government. By this expression they meant a wildlife policy based on science, rather than one based solely on economic criteria. What was even more important, however, was that the phrase usually implied a new ethic of coexistence between man and vermin.

The easiest accusation to level against the Bureau for Biological Survey and its supporters was that they were overzealous in carrying out their self-appointed mission of wiping out all predators, rodents, and other "critters." They had declared total war, regardless of cost or necessity, while their critics agreed that the government's goal of outright extermination of any species should be opposed. "I do not advocate favoring or allowing predatory mammals to breed anywhere without restriction," wrote ecologist Lee Dice of the University of Michigan in 1924, "but I am sure that the extermination of any species, predatory or not, in any faunal district [jj], is a serious loss for science". Biology had too many unanswered questions that predators could answer for scientists not to worry about their extinction - on this point there was a quick consensus. Similarly, it was fairly easy to find support for the proposal that predators be offered limited refuge - analogous to Indian reservations - in National Parks and other wilderness areas where conflict with man could not arise. "Only remote, isolated and poor lands", wrote CC Adams, were suitable for populations of large predators. However, these spaces existed everywhere in the country, overseen by the National Park Service, which had been established in 1916. These areas offered the best opportunities to bring Americans closer to predator territories; the whole family could go to see their carnivores at such places without fear of losing an arm, just like going to the zoo. "We are probably the richest nation on earth," Adams noted:

What would it cost to keep a hundred mountain lions in the United States? Would this cripple American civilization? We have millions of acres[kk] in National Forests, Public Domain lands and National Parks. Some of them could be

[jj] Type of subdivision of biogeographical regions. *N. del t.* [kk] An acre is equal to about 0.4 hectares. *N. of t.* manage so that some of these animals could be preserved and could even eat deer meat!

This idea must have been persuasive, because in 1936 all forms of predator hunting in National Parks were ended. This decision was vigorously contested by the OEB, whose field staff began secret raids into the parks to eliminate their vermin. And it

was not uncommon thereafter to see the edges of a park ablaze with cyanide-laden coyote traps. However, the idea of limited refuges instead of total extermination took root.¹⁶

Eventually the bureaucratic leadership of the Bureau came to agree to this policy of symbolic preservation, though it was never very successful in conveying that commitment to its hunters in the West. The Bureau was also never as aggressive in preserving carnivores as it had been in destroying them. Expert biologist Stanley Young, who had once been a federal vermin control agent and became one of the most respected predator scholars in the country, had to accept that in the farthest reaches of the continent, “wherever these great murderers can exist without direct conflict with man”, could be tolerated. About the National Parks, however, he was less convinced. These places were established, he believed, more to protect game species than to give refuge to carnivores. And he was also adamant in his assessment of the moral character of predators: the wolf “is one hundred percent criminal, it kills out of sheer thirst for blood. ... [A]ll wolves are killers. They are murderers of both cattle and wild prey, and these murders are not only resorted to by the so-called renegades”. However, Young was not the only one of the Bureau employees who admired these villains, despite all their depravity. In his series of studies on top predators, now taken as a model, he repeatedly stressed that he did not want to see them disappear from the face of the earth forever. As long as a few could find some godforsaken corner where there was absolutely no chance for them to compete against humans, he was willing to grant them sanctuary. “Despite all that is wrong with the wolf,” he wrote in 1930, “I personally consider this animal our most wonderful quadruped, and have often wished it would change its manners just a little so that the hand of man would not have to be affected.” constantly raised against this predator. In my opinion he is the ‘king of predators’”. Driven by these sentiments, the OEB leaders backed away from their goal of total eradication, until by the end of the 1930s they had firmly substituted “control” for the word “extermination.” However cautious this ideal might sound, controlling predators essentially meant eliminating them all wherever man wanted to use the land for farming or hunting. Large predators, Young continued to insist, “had no place in modern civilization.”¹⁷

To believe that predators should have more than an open-air zoo existence, that they could play a valuable role in a civilized world, was a more radical proposition and

¹⁶ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

¹⁷ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

certainly met with official resistance. However, some scientists actually went so far as to defend it, drawing from the classical ideal of the "balance of nature" a utilitarian justification for keeping predators on the scene even if economic losses were incurred. They argued that all carnivores, large and small, are an important means of controlling not only wild herbivores such as deer but also destructive rodents such as rats, prairie dogs, mice, and voles. Most rodents, of course, were not highly valued by man due to the threat they posed to his health and property. So the discovery that coyotes fed heavily on these critters gave this little canid a useful, even indispensable, social role. Without such an efficient natural enemy, rodents could invade the world; and then poisons would have to be used to resolve an imbalance caused by other poisons. Overall, nature's pest control system was safer, more effective, and cheaper than anything OEB could devise. This line of reasoning was applied by a number of biologists, beginning in the 1920s, in response to government eradication programs, and would serve as a prototype for an important new type of conservation: ecological pragmatism. The preservation of checks and balances, at least as many as possible, would spare society the risks and expense of applying crude substitutes. Thus, predatory vermin came to be seen more as valuable stabilizing forces than mere curiosities to be saved only in token numbers.¹⁸

However, the Bureau was unwilling to give its critics any advantage in appealing to the economic and practical. His subsequent self-defense ranged from withholding evidence to a persistent dismissal of the coyote's importance as a rodent controller. In 1929 Olaus Murie, one of the Bureau's own wildlife biologists, was questioned by agency leadership about his thoughts on how predator control had affected the balance of nature. Unfortunately, Murie's five-page response concurred with critics who said the Bureau was creating chaos in the natural order. The letter was immediately buried in the OEB archives, and Murie was instructed to stay away from the St. Louis wildlife conference at which she was scheduled to speak. Around 1936, his article on "Coyote Feeding Habits in Jackson Hole, Wyoming"¹⁹ was carefully misplaced in the same obscure file at headquarters where his letter had disappeared; no adverse criticism could be allowed to come from within the Bureau's own ranks. In the meantime, the OEB exposed to the public all the little clues it could find to demonstrate the negligible effect of coyotes on rodent populations. In the study of some 40,000 samples, collected from the stomachs of coyotes by government trappers between 1918 and 1923, the most frequent contents were rabbit, sheep or goat meat, bait, beef, carrion, and

¹⁸ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

¹⁹ Original title: "Food Habits of the Coyote in Jackson Hole, Wyoming." *N. from t.*

grass or berries. “The sum of domestic livestock, poultry and game meat exceeds the number of rodents,” noted WC Henderson. And he concluded that the available food supply and disease, and not coyotes, must therefore be the most important control mechanisms in the 22 rodent populations.²⁰

It might seem that collecting this kind of empirical evidence would be the best way to establish the value of the coyote and other predators to the balance of nature, but, on both sides, the facts were invariably mixed with subjective feelings. If one was a hunting enthusiast, then the predator was an important control mechanism in the populations of huntable species, a “born killer” that had to be eliminated from the wild if prey was to survive to be hunted. If you were a government trapper trying to secure your job, it was obvious that the coyotes and wolves ate only game and livestock, never hunting any rodents. But if one opposed the poisoning policy, it was clear that predators ate mainly crop-damaging rodents, had no effect on the game population, and rarely bothered to kill sheep or calves. Even today it is far from easy to determine the long-term effects of predators on prey populations, probably because the relationship varies so much from place to place and from species to species. All generalizations about this topic end up being somehow inadequate to represent the economy of nature and the irrefutable data ends up being clouded by 23 economic and moral values.²¹

Perhaps because they felt they were treading on treacherous ground, defenders of the Office too often decided to ditch the idea of the balance of nature altogether, as at best an unreliable guide to establishing wildlife policy. American. EA Goldman, for example, in a 1925 article, “The Predatory Mammal Problem and the Balance of Nature,” suggested that “with the occupation of the continent by Europeans who carried guns, cleared the forests and created permanent settlements , the balance of nature was violently eliminated, never to be restored again. In 1930 the editor of the *New Mexico Conservationist* put the idea bluntly:

It’s a sonorous phrase, this Balance of Nature, and we too used to hold it in high esteem until we discovered it meant nothing. ... Nature has never been in balance anywhere for very long. Something always happened that disturbed the pre-existing regime. Sometimes it was the invasion by coyotes of a virgin habitat, sometimes it was a climatic catastrophe that eliminated certain species and left others behind, and once it was the arrival of man on the continent. . The sentimentalist will say that the coyote has as much right to existence as the game he has appropriated for his use, and sentimentally speaking, that logic is flawless. Unfortunately, we hunting barbarians don’t love the coyote and we love the game species. And we are willing to risk the effects of forcing Mother Nature’s balance a little more in order to satisfy our tastes in this regard.

²⁰ “Red pine” in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

²¹ Page 114.

This last sentence says it all. Despite his openly declared disenchantment, this individual found it difficult to completely shake off the traditional idea that there is a balance in nature; whether it is ever perfectly attained or not, it was a useful notion, perhaps an indispensable one. Like the related idea that there is a climax stage, the idea of the balance of nature should continue to be used, despite all its problems and in the absence of anything better. Defenders of the Office seemed to acknowledge this even as they attacked the idea.²²

The most pressing issue was whether man should respect and abide by the balancing forces of nature or whether he could safely ignore them. How one answered this question depended on one's confidence in human managerial skills, as well as one's willingness to take risks to achieve the kind of world one wanted. The anti-predator side believed that man could only be happy in a totally modified environment. "Why is it always considered a bad thing to disturb the balance of nature, that is, to upset the natural scheme of things?" a pest control agent asked. "Hasn't man survived and improved his standard of living in direct proportion to the degree of control achieved over nature and the manipulation of its balance for his own benefit?" EA Goldman argued, again in 1925, that since it was impossible to restore the original order in America, man could also face the fact that "there are practical considerations which require him to assume effective control of the wild fauna everywhere". Past interference, it seemed, served to justify even greater interference in the future. To worry excessively about a natural balance was to hinder progress. In 1948, Ira Gabrielson, then director of the Office, insisted that "in any case it will be human interests, and not the ideal of an ecological balance or the rights of predators, that will dominate the type, degree and trajectory of the predator control."²³

Thus, when understood in the purely pragmatic terms of ecological stability and human self-interest, defense from predators ran into difficulties. Those who wanted to keep predators in the environment as a useful way of keeping increasing numbers of rodents and herbivores under control had a powerful reason, but this could be countered with strong arguments regarding the financial losses suffered by livestock and livestock activity. hunting. While ecological prudence might have suggested a more cautious control program, a vigorous attempt to purge the earth of vermin was still best suited to man's ambition. Recognizing this impasse, some critics began shifting their defense of big predators toward non-economic aspects: wolves, coyotes, pumas, and grizzly bears were now seen as having a moral right to exist, even when they might interfere. for human purposes. The purpose of wildlife management, according to this perspective, was to find the best compromise solution between man and his carnivorous competitors, one that recognized both parties as members of the land community and

²² "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²³ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

sought their reconciliation. Therefore, there had to be an ethical as well as an economic motive behind the call for an ecologically determined wildlife management policy.

For several decades one of the spokespersons for this community ideal[mm] of management was Olaus Murie. Born in Minnesota, he studied wildlife biology at the University of Michigan before going to work for the Office for Biological Study as a field biologist in 1920, a time when researchers were outnumbered ten to one by researchers, hunters and trappers within the agency. He spent several years roaming the northern wilderness of the continent, from Labrador and Hudson Bay to Alaska. In Alaska, Olaus worked with his brother Adolph, who in 1939 would begin his famous study of wolves in Mount McKinley National Park. In the summer of 1927, Olaus and his wife Margaret were sent by the Bureau to Jackson Hole, Wyoming, to study the life history of elk and the factors affecting their well-being. Olaus had been working for the OEB in the El Refugio Nacional del El Wapiti for almost twenty years, and during all that time -in fact until 1963- he somehow managed to stay out of the official philosophy of game production, playing the role of a tolerated dissident who was disregarded. It must not have been easy for such a mild-mannered man to be out there with so many of his colleagues for so long. Yet he was fierce enough to persist throughout those two decades in his attempts to transform the Bureau from anti-predator bias toward an "ecological vision."²⁴

At no point in her career did Murie reject any interference with nature or any attempt to control predators. He accepted the need for management, especially in cases where one or two animals brought serious losses to the small farmer struggling to make a modest living. What offended Murie's sense of justice was that the Bureau took part in inciting the

[mm] It refers to the ideal based on the idea of biological community. *N. from t.* irrational and uncompromising hatred against all predators. In a 1929 memorandum to the agency's director, he noted that the same government conservationists who were teaching the public to restrict hunting of migratory birds were simultaneously putting out "glossy posters, showing gory and unsightly scenes" urging people to to eradicate carnivores. "It seems to me completely unnecessary and undesirable," he wrote, "to hatefully kill those creatures that cause harm." A year later, he recommended to the same person that "sympathy should be felt for wildlife in general and that we should do more to discover the *good* that there may be in some species that have a bad reputation." Murie just liked vermin. He was biased in favor of large predators, admitting that "I also like to see the so-called nuisance rodents hanging around." "There is no animal that I dislike because it eats," Howell explained to Brazier. "If an animal eats to the point of excessively harming me, I will respond, but only just enough to alleviate the situation, and without hate." He told Milton Hildebrand of the Sierra Club that it was the harmful predators he wanted to preserve: "They are the ones that are really threatened." Shortly after leaving the Bureau - or rather its successor agency, the Fish

²⁴ "Sweat lodge" in the original. *N. from trans.*

and Wildlife Service[nn] - he wrote a letter to its associate director, Clarence Cottam, explaining the crux of his criticism:

I know ranchers who are much more tolerant of coyotes than our Service is. I know many hunters who are much more tolerant. I know quite a few people who would like to have a tolerant world, a world that we can share with the wild creatures. Many people like to think of the beneficial side, the inspirational and scientific values, of creatures like the coyote, as much as their destructive side. This is the opposite of our official position.

From the looks of it, his two decades of protest didn't have much of an effect; the speech in favor of total extermination was over, at least in the upper bureaucratic circles, but the vermin were still vermin. And more often than not, for the agency man working in the field, the only good vermin was the dead vermin.²⁵

After resigning from his position with the Fish and Wildlife Service, Murie served as director and then president of the Wilderness Society for most of the 1950s. His years with the federal government agency, from 1920 to 1946, practically coincided with the years of agitation on the part of the Society of Mammalogists. And in a larger context, those years witnessed a gradual transition into a new era of popular ecological awareness. The Dust Bowl[oo] experience was a crucial factor in the emergence of this new conservation philosophy; the matter of the predators was another. By the end of this period, the public was more or less prepared to heed the appeals of Rachel Carson and Barry Commoner, who, like scientific activists such as Clements, Murie, and C. Adams, were looking to the discipline of ecology for basis for a new relationship between man and nature, and for a new environmental ethic. nn "Fish and Wildlife Service" in original. *N. from t.*

[oo] Literally "Dust Bowl", "Dust Bowl" is the name by which the phenomenon is known in English that in the 30s of the 20th century affected the plains and prairies that extend from the Gulf of Mexico to Canada . The drought-resistant grasses of the original prairie ecosystem had been replaced by wheat crops, which, failing due to drought, left the soil bare, causing dust storms of unprecedented magnitude. *N. from t.*

Murie and others like him might not immediately prevail, in terms of practical results. However, they won over one of the main fans of the Pinchot school, the man widely regarded as the father of American wildlife management: Aldo Leopold. Leopold died in 1948, while fighting a forest fire in Wisconsin, and thus belonged to the middle generation of that transition from the utilitarian to the ecological approach to conservation. Just before his death, however, he finished his now famous essay "The Land Ethic"[pp]. More than any other written work, this text marked the arrival of the Age of Ecology; in fact, it would come to be regarded as a single, and most concise, expression of the new environmental philosophy. It brought together a scientific

²⁵ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

approach to nature, a high degree of ecological sophistication, and a biocentric[qq] and community[rr] ethic that challenged the dominant economic attitude toward land use.

Leopold's conversion, as I said before, was not exactly a sudden realization like that of Saint Paul on the road to Damascus. Even while he was still spouting numbers on productivity and agronomic ardor, he was beginning to slip out of the progressive frame of mind. During his early years in the Forest Service, for example, he came to the conclusion, clearly contrary to Pinchot, that public lands should be preserved as wilderness[560] or roadless[tt], to to be protected from any future economic development. In 1924, largely due to his efforts, more than half a million acres of the Gila National Forest in New Mexico were declared a wilderness[uu]. By the time *Game Management* appeared nine years later, it was clear that Leopold was more dissatisfied than ever with his own ideal of a controlled environment. I was trying to argue in that work that the idea of cultivating and harvesting was only a preliminary to a more advanced relationship with the land, to a higher stage in "moral evolution" that would one day come.

Twenty years of "progress" have brought the average citizen a vote, a national anthem, a ford, a bank account, and a high opinion of himself, but not the ability to live in high densities without dirtying or stripping his surroundings, nor the conviction that it is said capacity, and not said density, the true criterion that indicates whether he is civilized. The practice of game management can be one means of developing a culture that meets this requirement.

But still, however, he had not been able to define for himself exactly what that most capable culture or attitude should be. Hence, he was forced to speak vaguely of "that new social concept towards which conservation is groping" .[28]

In the same year, Leopold also published an essay entitled "The Conservation Ethic," which gave some insight into where his own efforts were leading him. In it he went on to speak of "controlled feral cultivation or 'management'", of harvesting and being "industrial logging". However, he also criticized the attitude that land is merely property that can be used in any way its owner wishes. "The relationship with the land", he lamented, "is still strictly economic, implying privileges, but not obligations". One of the sections of the essay was entitled "Ecology and economics". He had already begun to think that the two things were not entirely compatible; it was moving away from the vision of conservation based on the supply and demand of resources and leaning towards an attempt to "harmonize our civilization of machines with the land, from which its sustenance comes" - towards "a universal symbiosis".[29]

According to Leopold's biographer, Susan Flader, this conversion to an ecological basis would not be complete until 1935, the year in which he joined with others to form the Wilderness Society. It was also that year that he learned first-hand of the intensely artificial German management methods, which he disliked so much that he became suspicious even of his own bias in favor of landscape regulation. And also during that crucial year, he found an old abandoned cabin near Baraboo, Wisconsin, where, until the moment of his death, he would in rare moments live the life of a Gilbert White[vv]

or a Henry Thoreau—a rural naturalist. living apart from technological culture, seeking to strengthen their bond with the land and its processes. From then on, Leopold’s main concern was the need to re-establish a personal relationship of coexistence with nature, rather than the large-scale, impersonal management of resources by a professional elite.²⁶

The fruit of the Baraboo years was his *Sand County Almanac*, a set of rural natural history sketches published posthumously in 1949. Disenchantment with the overmanaged modern world is the persistent theme of these essays. “Nothing could be more convenient at this stage,” he declared, “than a healthy little disdain for a plethora of material blessings. Perhaps such a change in values is achieved by reassessing things that are unnatural[ww], tamed and confined with respect to things that are natural, wild and free”. His own 120-acre farm, though badly damaged by the abuse of many decades of careless farming, was now filling with sprouting oaks[562] and pines, a paltry but welcome prophecy of the second coming of the nature. Elsewhere, however, and nowhere more than in the Midwest around him, land was falling into the hands of scientifically minded farmers trained in state colleges by agricultural extension agents to maximize agricultural production. Substituting the diversity of vegetation and wildlife of the pre-historic prairie, they standardized the land to grow corn, wheat, or soybeans—“clean agriculture,” they called it—just as Leopold himself had once wanted to raise deer on a perfect world without wolves “Have we learned the first principle of conservation: to conserve all the parts of the earth’s mechanism?” he wondered. “No, because not even the scientist knows all of them yet.” Leopold’s disillusionment with the too tightly managed landscape affected even his devotion to science. He had by then come to feel that the typical academic researcher was too narrow in his perceptions to capture the whole of nature, something that should be essential in the practice of a broader form of conservation. One of the essays in the *Sand County Almanac* was entitled “Natural History-The Forgotten Science”[yy]: it was a plea for a return to holistic education and abroad, to a style of science open to hobbyists and sensible nature lovers; one more sensitive to the “pleasure of being surrounded by wild things”. It was feared that, in the way it was being taught in laboratories and universities, “science served progress.” He was in complicity with the technological mentality that ruled the world, pursuing a merely material advance. That had to be changed, along with the inclination to manage.[564]

The culminating essay in what turned out to be his last book, and thus Leopold’s final word on man’s place in nature, was “The Land Ethic,” written in late 1947 or early 1948. Its subject matter elaborated ideas mentioned more briefly elsewhere: essentially, the inappropriateness of seeking economic profit from conservation. In the preface to *Sand County Almanac*, for example, he had noted:

²⁶ “Rat wall” in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

Conservation is getting nowhere because it is incompatible with our Abrahamic concept of the land. We mistreat the land because we consider it a commodity that belongs to us. When we see the earth as a community to which we belong, we can begin to use it with love and respect.

The "land ethic" he had in mind was precisely this sense of ecological community between man and all other species, replacing "the tedium of the merely economic attitude towards land." Previous ethical norms had been concerned only with man's obligations towards others of his own kind; as such they were at least evidence of a feeling of fellowship, of common interest and reciprocal support, "a kind of incipient community instinct." Now, he argued, man's own well-being requires that the circle of cooperative and communal relationships be extended to include all beings. This ecological ethic would change the role of man, from master of the earth to "mere member and citizen of it." It was a wholly democratic ideal, in its own way as utopian as the progressive desire to modernize the world. By then, Leopold had almost completely broken with the Pinchot-style conservation school, on the grounds that it felt "no inhibition against violence; their ideology is agronomic". By contrast, the new conservation "feels the stirring of an ecological conscience." [565]

During this long process of personal conversion, Leopold continually returned to the problem of what to do with carnivores. Ultimately underlying the fate of this order of creatures is the viability of their ecological ethic. It was easy enough to tolerate chickadees[zz], or even garden snakes[aaa] and field mice; they were also prolific enough to withstand all but the most violent human interference. However, carnivores, ironically, were far more vulnerable to human power; consequently their future as integral members of the biotic order hung on the thin thread of human will to accommodate them. In "Round River," Leopold wrote:

Harmony with the earth is like harmony with a friend; you can't caress his right hand and amputate his left. I mean, you can't love hunting prey and hate predators; you can't conserve water and ruin the grounds; you can't create the forest and undermine the farm. The earth is a single organism.

For vermin to be accepted as a legitimate part of organic nature, Leopold was not prepared to argue merely on pragmatic or utilitarian grounds. Whether predators controlled rodents for farmers or ate only "worthless" species was irrelevant. The "more honest" reason, Leopold believed, was simply "that predators are members of the community, and that no vested interest has the right to exterminate them for its own benefit, real or perceived." [566]

Ecology revealed to Leopold a new dimension of the age-old notion of natural rights. This idea, especially strong in Anglo-American culture, had historically been used (as in the Declaration of Independence[bbb]) to legitimize the reassertion of individuals or nations against a controlling power. Certain inalienable rights corresponded to all men by the very order of nature, it was assured. However, natural rights had never encompassed the rights of nature. Ecological awareness, on the other hand, would extend these concepts to all species, even to the earth itself. The rights to life and

liberty -perhaps even to the pursuit of happiness- should protect all beings, since all were part of the biotic community. However, unlike previous appeals to natural rights, this was not a demand made or imposed on the ruling class by an excluded minority; rather it required a moral decision by that powerful elite on behalf of the voiceless lower orders. Investing the prevailing order with the power to determine the justice of its own acts is always an act of faith and, for that reason alone, the rights of nature are always in danger. In a way, however, this new doctrine had its own convincing power, apart from human whim. Unless man recognized the rights of the entire family unit to the land, Leopold warned, he could find his own survival threatened by environmental collapse. It had happened before, as close as the Dust Bowl years.

There was, however, a weakness in Leopold's land ethic that he never even suspected: it was too tied to the science of ecology to escape economic bias. Of all the sciences, this branch undoubtedly came closest to his nostalgic ideal of natural history coupled with holistic compassion. However, just at the time when he embraced ecology as a way out of the narrow economic attitude towards nature, nature was moving in the opposite direction, seeking its own niche in modern technological society. It was preparing to become abstract, mathematical, and reductionist. Furthermore, ecologists were recasting with increasing devotion the very concepts of progressive conservation and agronomy that Leopold wanted to play down: efficiency, productivity, extraction, cultivation. By the late 1940s, ecology was ready to sweep away all the organic and communal cobwebs that had been accumulating in its corners for so long, and to adopt a new forceful mechanism as its predominant stance on nature. Leopold could not know it, of course, but all this would soon make his "ecological awareness" a very shaky, perhaps untenable goal.

However, it must be said that these incompatibilities between science and moral value were already visible, to a certain extent, in Leopold's own environmental thought. For, for all his disenchantment, he never quite broke with the economic view of nature. In many respects, his land ethic was merely a more enlightened, long-term prudence: a surer means of achieving an infinite expansion of material wealth, just as he promised in "Natural History." Although he gave up his ambition to make the land produce only the most desirable crops, he continued to speak in agronomic terms; therefore, the entire earth became a crop to be harvested, even if it was not fully planted or cultivated by man. Concern for "healthy running," overall productivity, and stability replaced the desire for immediate business benefits. Furthermore, while he came to see the earth as "a single organism", he went on to describe it as "an ecological mechanism", in which man functions as an important economic cog. "Keeping all the parts and gears," he wrote in an undated essay, "is the first precaution of an intelligent mechanic"[ccc]. This vacillation between basic metaphors can be read as casual or superficial, but this defense ignores the fact that "organism" and "mechanism" have been around for at least three centuries, and have been identified over the course of that time. consistently with antithetical worldviews. It might be objected that Leopold was trying to reconcile these rival visions, at last, in a new synthesis of conservation; your readers will have to

assess for themselves how successful this reconciliation was. However, he stopped short of examining in detail the tension between these two historically opposed sets of values; nor did he directly and fully confront the problem of whether a genuine solution was really possible. In short, he did not become as much of a philosopher as he should have been to carry out the task he undertook. As a consequence, it may have obscured from the popular consciousness of ecology a fundamental and inevitable source of ambiguity and conflict. People who advocate incompatible forms of conservation might find him an acceptable prophet - until they begin to apply the idea of the land ethic to concrete situations.[567]

It seemed that whether the coyote or the wolf could be allowed to have a place in civilized America would then depend on whether economics continued to dictate environmental values. The security of the vermin's future lay in the possibility of a shift to an ecologically based philosophy of conservation - so Leopold, Murie, and several other scientists and wildlife enthusiasts believed. At that time, however, no one seemed to suspect that ecology itself was evolving towards an economic perspective, that it was absorbing into its theoretical structure the very terms of the old agronomic conservation.

Grades:

1. George Laycock, "Travels and Travails of the Song-Dog," *Audubon* 76 (September 1974). Joe Van Wormer, *the World of the Coyote* (Philadelphia, 1964). Very controversial but evidence-based is: Jack Olson, *Slaughter the Animals, Poison the Earth* (New York, 1971). On the wolf, see L. David Mech, *The Wolf* (Garden City, NY, 1970); Paul Errington, "Of Wilderness and Wolves," *Journal of Wildlife Management* 33 (Fall 1969); and Douglas Pimlott, "Wolves and Men in North America," *Defenders of Wildlife News* 42 (Spring 1967).

2. J. Frank Dobie, *The Voice of the Coyote* (Lincoln, Nebr., 1961), px Theodore Roosevelt, "A Cougar Hunt on the Rim of the Grand Canyon," *The Outlook* 105 (May 1913): 260. See also Frank Graham, jr., *Man's Dominion: The Story of Conservation in America* (New York, 1971), pp. 272-278.

3. A typical interpretation of progressive conservation would be: Samuel Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge, Mass., 1959). See also J. Leonard Bates, "Fulfilling American Democracy: The Conservation Movement, 1907 to 1921," *Mississippi Valley Historical Review* 44 (June 1957): 29-57.

4. Jenks Cameron, *The Bureau of the Biological Survey* (Washington 1929), chap.1. Victor Shelford, "Biological Control of Rodents and Predators", *Scientific Monthly* 55 (October 1942) pp. 331-332. Robert Connery, *Governmental Problems in Wild Life Conservation* (New York, 1935. Advisory Commission on Predator Control (Stanley A. Cain, Chairman), "Predator Control-1971" (report to the Council for the Environ-

mental Quality and the Department of the Interior), pp. 1-2. This is the famous *Cain Report* that led to the restriction of poisoning on public lands in 1972.

5. Sigurd Olson, "A Study in Predatory Relationships, with Particular Reference to the Wolf," *Scientific Monthly* 46 (April 1938): 323-336. Cameron, *The Bureau*, p. 5552. WC Henderson, "The Control of the Coyote," *Journal of Mammalogy* 11 (Aug 1930):336-350.

6. The continuing influence of the sheep industry on government wildlife programs was even noted in the 1964 *Leopold Report*, "Predator and Rodent Control in the United States," of the Advisory Board on Wildlife Management (A. Stalker Leopold, Chairman).

7. Cameron, *The Bureau*, p. 40. Vernon Bailey, "Destruction of Wolves and Coyotes: Results Obtained during 1907," United States Department of Agriculture, Bureau for Biological Survey, Circular No. 63 (1908). The official attitude towards birds of prey, however, was much more positive, as can be seen in the AK FISE pamphlet, "Cause of the Prejudice Against Birds of Prey"[ddd], OEB Circular No. 61 (1907).

8. Gifford Pinchot, *Breaking New Ground* (New York, 1947), pp. 120, 342-343. See also Nelson McGeary, *Gifford Pinchot, Forester-Politician* (Princeton, NJ, 1960) and Elmo Richardson, *The Politics of Conservation: Crusades and Controversies, 1897-1913* (Berkeley, Calif., 1962).

9. Pinchot, *Breaking New Ground*, p. 31.

10. John Lorain, *Nature and Reason Harmonized in the Practice of Husbandry* (Philadelphia, 1825), esp. pp. 24-27; see also Clarence Glacken, *Traces on the Rodhian Shore* (Berkeley, Calif., 1967)[eee], pp. 693-698 and George Perkins Marsh, *Man and Nature: Or, Physical Geography as Modified by Man Action* (1864;

[ddd] "Cause of Prejudice Against Birds of Prey". *N. from t.*

[eee] There is an edition in Spanish: *Footprints on the beach of Rodas. Nature and culture in Western thought from Antiquity to the end of the 18th century*. Barcelona, Ediciones del Serbal, 1996. *N. from t.*

Cambridge, Mass., 1965), p. 91-92. Also, Davis Lowenthal, *George Perkins Marsh, Versatile Vermonter* (New York, 1958). For Pinchot's reaction to Marsh, see Pinchot, pp. xvi-xvii.

11. On the development of game conservation see James Trefethen, *Crusade for Wildlife* (Harrisburg, Pa., 1961) and *Wildlife Management and Conservation* (Boston, 1964).

12. Emerson Hough, "The President's Forest," *Saturday Evening Post* 194 (January 14, 1922): 6-7; (January 21, 1922): 23. John Russo, "The Kaibab North Deer Herd - Its History, Problems, and Management," Arizona State Department of Fish and Game, *Wildlife Bulletin* 7 (July 1964). D. Irwin Rasmussen, "Biotic Communities of Kaibab Plateau, Arizona," *Ecological Monographs* 11 (July 1941): 229-275.

13. Rasmussen, *op. cit.*, pp.236-238. See also Walter P. Taylor (ed.), *The Deer of North America* (Harrisburg, Pa., 1956).

14. Aldo Leopold, *Game Management* (New York, 1933), p. 21. The only study of Leopold's career in its entirety is Susan Flader's book, *Thinking Like a Mountain: Aldo Leopold and the Evolution of an Ecological Attitude Toward Deer, Wolves, and Forests* (Columbia, Mo., 1974). For shorter accounts, see Roderick Nash, *Wilderness and the American Mind*, revised edition (New Haven, Conn., 1973), chap. 11 and Donald Fleming, "Roots of the New Conservation Movement," *Perspectives in American History* 6 (1972): 7-91.

15. Leopold, *Game Management*, p. viii, 3, 20 and 396.

16. Flader, *Thinking Like a Mountain*, p. 59-61 and 93-94.

17. John Muir, the most prominent defender of the wild west, seems to have had little interest in predators. Other conservationists, including the founders of the National Audubon Society, actually supported the idea of predator reduction. Among the wild fauna, they favored birds and small mammals and their notion of "refuges" for these creatures was always aimed at protecting them from predators as well as exploitation by humans. This official position of the Audubon Society came under fierce attack by Rosalie Edge in the 1930s; see his writings at the Denver, Colorado Public Library's Conservation Center.

18. Charles C. Adams, "The Conservation of Predatory Mammals," *Journal of Mammalogy* 6 (May 1925): 83-96. "Symposium", *Journal of Mammalogy* 11 (August 1930). The Yellowstone resolutions were reprinted in *The Living Wilderness* (Summer 1950): 29.

19. Lee Dice, "The Scientific Value of Predatory Mammals," *Journal of Mammalogy* 6 (February 1925): 25-27. Adams, "Conservation of Predatory Mammals", pp. 90, 94 and "Rational Predatory Animal Control," *Journal of Mammalogy* 11 (August 1930): 357.

20. Stanley Young to Arthur Carhart, November 24, 1930, in the Writings of Stanley Young, Denver, Colorado Public Library Conservation Center. See also Young's monograph, "The Saga of Predatory Animal Control", typescript, 1956 (?) in the same archives. Also his book with EA Goldman, *The Wolves of North America* (Washington, 1944).

21. A corollary of this pragmatic stance was to oppose predator regulation programs on the grounds that they frequently inadvertently killed species not targeted by the program, especially carnivores whose fur was valuable, such as mink, badger, or stoat. For an example of this common argument, see Joseph Dixon, "Fur-bearers Caught in Traps Set for Predatory Animals," *Journal of Mammalogy* 11 (August 1930): 373-376.

22. Olaus Murie, "Memorandum to Mr. Redington," August 30, 1929 (carbon copy in the Writings of Olaus Murie, Denver Public Library Conservation Center, Colorado). Henderson, "Control of the Coyote," p. 347.

23. The most complete studies on this matter have been those of Paul Errington; see his articles "What Is the Meaning of Predation?", *Annual Report of the Smithsonian Institution, 1936* (Washington, 1937) and "A Question of Values", *Journal of Wildlife Management* 11 (July 1947) : 267-272, as well as his book *Of Predation and Life* (Ames,

Iowa, 1967), especially pp. 204-205. Also useful is Durward Allen, *Our Wildlife Legacy*, chapters 14 and 15.

24. EA Goldman, "The Predatory Mammal Problem and the Balance of Nature," *Journal of Mammalogy* 6 (February 1925): 28-33 and "The Coyote - Archpredator," *Journal of Mammalogy* 11 (Aug 1930): 330-331. *New Mexico Conservationist* (April 1930): 14-15.

25. Walter Howard, "Means of Improving the Status of Vertebrate Pest Control," *Transactions of the 27th North American Wildlife and Natural Resource Conference* (Washington, 1962). Goldman, "The Predatory Mammal Problem," p. 31. Ira Gabrielson, *Wildlife Conservation* (New York, 1948), p. 208.

26. Olaus Murie's career and outlook on nature are best captured in his memoir co-written with his wife, Margaret Murie, *Wapiti Wilderness* (New York, 1966). The summary given here is also based on extensive readings of his letters and other of his writings.

27. "Memorandum to Redington," p. 4. Letter from OM to Redington, October 11, 1930. To A. Brazier Howell, May 7, 1931. To Hildebrand, August 28, 1950. To Cottam, December 7, 1952, regarding the subordination of the Service of Fish and Wildlife with respect to economic values instead of ecological ones. All of them in Writings of Olaus Murie.

28. Leopold, *Game Management*, p. 422-423.

29. Leopold, "The Conservation Ethic", *Journal of Forestry* 31 (October 1933): 634-643.

30. Flader, *Thinking Like a Mountain*, p. 28-30.

31. Leopold, *A Sand County Almanac*, p. xix, 124-127, 162-163, 190 and 202-210.

32. *Ibid.* pp. xviii and 237-264.

33. *Ibid.* pp. 189-190 and 247.

34. *Ibid.* pp. 190, 210 and 251.

Presentation of “RESPECT THE AUTONOMY OF NATURE IN RELATION TO HUMANITY”

From reading this article one can draw at least this rule: unfortunately, when “philosophers” get involved in trying to clarify important, serious and complicated issues, the result too often is that they end up complicating them even more and rendering them even less intelligible. and clear (all this unnecessarily, of course).

Actually, the article deals with important themes and ideas that are worth reflecting on: the possibility of coexistence between human societies and Nature (wild and non-wild) and what would be its limits and criteria, the notion of the autonomy of Nature, the very notion of Nature, etc. This is the reason why we publish it. However (yes, as usual, there is a long “however”...), there are many aspects of the position defended by the author that are more than questionable. We will discuss the most important ones below.

The author of this text, Ned Hettinger, intends to offer a (supposedly innovative) concept as a solution to the old dilemma of how to reconcile human existence, activity and prosperity with the preservation of Nature. This concept would be what he calls “respect for the autonomy of nature in relation to humanity”. According to him, respect for this peculiar notion of the autonomy of Nature is the key to solving this dilemma and allowing coexistence and even “positive” interaction of human societies with Nature.

The author seems determined to find a way for human beings to play a “positive” or “constructive” role in Nature. And the first question that comes to mind is: “why?”. Why should human beings play a “positive” role in Nature? Moreover, what does “positive” mean here? And is it really possible for human beings (especially the inhabitants of techno-industrial society) to play such a role?

To begin with, it should be noted that the author, like many other inhabitants of today’s techno-industrial society, has assumed the idea that things, people and relationships must always be “positive”/“constructive” and that the “positive” /“constructive” is always better than “negative”/“destructive”. But, the fact is that many times they are not, nor can they be (however “positive” or “constructive” is understood). What’s more, sometimes, neither the “positive”/“constructive” is so good, nor the “negative”/“destructive” is as bad as it is claimed. In this case, playing a “positive” or “constructive” role

in Nature sounds too much like trying to improve or correct Nature. And we already know how this ends too often. The author insists that human beings have to have a "positive" role in Nature, when in reality, it would be enough if they really stopped having a "negative" role or reduced it to the maximum (and of course, the latter, if possible, it will not be achieved through "respect" for an ethic but with facts).

The impression that remains after reading the text is that the author starts from the assumption that it is possible for humanity to exist and prosper in some way *in* Nature, using it without harming it or even playing a role. beneficial for it, not so much because there is evidence that this is really possible, but rather "by ideological imperative", that is, to make reality fit with its pre-established humanist and progressive ideas, values and objectives. But what if all that "positive" interaction with Nature really wasn't possible? In fact, there is no evidence at all that it is possible not only for humanity to improve Nature, but merely not to harm or subdue it at all. Even the simplest and most technologically undeveloped societies and ways of life (nomadic hunter-gatherers) produce certain impacts on the natural environment, somehow and to a certain extent, both immediately and in the long run. So, a more adequate and realistic position would be to assume this fact and, therefore, merely aspire to reduce the damage to Nature as much as possible, minimizing this negative interaction by reducing the material conditions that allow and aggravate it (high demography and high level of social and technological development, fundamentally), instead of trying to establish and foster an implausible and indefinite "positive" relationship with it.

Although the preservationist position that defends separating certain areas by law and restricting human presence and activity in them (what the author calls "apartheid"; we suspect that not without a certain tinkle) is ineffective in the long run and on a large scale and only partially effective in the short term and at the local level (since it is not possible to prevent the techno-industrial society from destroying or altering in one way or another legally protected ecosystems, not to mention the rest of the earth's surface), the author's supplementary proposal does not make it just more feasible. The author's perspective is clearly idealistic and voluntarist, that is, the author believes that the damage caused to Nature is basically due to the fact that humanity has wrong ideas and values and/or that the appropriate values are not "respected". And therefore, he believes (or prefers to believe) that if an effort is made to adopt and "respect" the appropriate ideas and values, humanity will be able not only to preserve Nature, but even to use it without damaging it (or even benefiting it). However, the main causes of the impact that humanity causes in the natural world are not ideological, nor does said impact depend mainly on the will to "respect" or not "respect" certain values. The root causes are material. All societies have minimum material needs that inevitably imply causing an impact on Nature. And these needs and this impact increase in direct proportion to the degree of material development (demographic and technological, basically). A population of billions of people, with an urban and technologically advanced way of life, needs to use much more matter, energy and space to merely exist and, therefore, will cause a much greater impact on Nature than a much smaller population

and technologically little. advanced, regardless of what your ideas and values are and whether or not you want to make an impact. Or put another way, what fundamentally determines the degree of human impact on Nature are the material needs of each type of society, not its attitude towards the natural world. And it does not matter what the ideology, values or attitude ("respect") of these human societies may be, which will not substantially and lastingly influence their material relationship with the natural world or its effects. This only in regard to merely existing and maintaining, let alone in regard to "prosper" (a concept that, in one way or another, always implies growing, developing, expanding, etc.). "Prospering" implies in the long run always inevitably *increasing* the ecological impact.

Once again, humanistic idealism makes an environmentalist author overlook obvious aspects of our relationship with Nature, such as material constraints and needs, and focus on relatively inconsequential aspects such as the will to "respect" an ethic or values. . Basically, everything comes down to being able or not to accept and face reality, the facts, when developing theories and trying to apply them.

Another problem with this text (and with this author) is that it plays with the notion of "Nature", in a vague way and with different meanings as it suits it. Thus, if Nature is conventionally understood as that which is not artificial, that is, that which is not the work of the human being, that which has not been created or modified by man, then it is not understood what the author is referring to. when you use expressions such as "rural nature" or "human-modified nature". Either these expressions would be mere meaningless oxymorons, or in them the author with "nature" is referring to something very different from what is normally understood as such (ie, the non-artificial). Perhaps the author wanted to refer to the fact that the part of those entities that continues to be non-artificial continues to be, therefore, Nature and must be respected, but the fact is that he does not pose it that way (that is, he does not limit himself to asking for respect by the natural part of those partially artificialized and domesticated entities; or to propose a gradual idea of "Nature", as a gradient formed by successive levels of artificiality), but simply does not differentiate between the artificial and the non-artificial part, inappropriately calling "nature" to the *set* of both and therefore demanding respect for both. Thus, for example, for him a cultivated field would be "nature (rural)" as a whole, without taking into account the different degrees of artificiality of the different elements that constitute it. The wild herbs, animals and micro-organisms that grow spontaneously in it are not comparable, as regards their degree of natural character, with the artificially selected and sown cultivated plants; nor the synthetic fertilizer added to the soil with the mineral nutrients typical of this type of terrain; etc. Obviously, in this case (or in all the cases to which the author refers with "rural nature" and similar expressions in the text), there are some elements that are less artificial than others, and his thing is to keep this in mind. account when evaluating the set, which therefore may be more or less natural depending on the number of elements of one type or another that it contains. However, in principle the author does not do it, probably because he does not consider it convenient for his

objectives, which are basically clouding the concept of Nature, in order to be able to swim (make a name among preservationists and influence them). and at the same time put away clothes (avoid conflicting with typical environmental, progressive and humanist values and goals). Thus, Hettinger prefers to say that: "it is not convincing to say that a lake that was previously devoid of fish is no longer nature if humans introduce fish into it, nor is it credible to say that replanted forests, horses, or cattle are not nature. natural, which are artifacts created by human beings, as artificial as plastic chairs". But the point is that it is equally unconvincing to suggest that all these more or less artificial entities are as natural as unmodified and uninfluenced lake ecosystems, native primary forests, or undomesticated wild herbivores. In this way, the author falls into exaggerations and falsehoods very similar to those of those whom he claims to be refuting.

Another very clear example of the latter is the gibberish that the author weaves around the concept of autonomy of Nature. Again, the author uses a vague and artificial notion, in this case of "autonomy", to first sow confusion and then sell us his remedy: the idea of "autonomy of nature with respect to human beings".

Let's go by parts:

The notion of autonomy suggested by the author is more than questionable. In principle, the author defines the autonomy of nature merely "in the negative" and in relation to humanity, that is, only as the absence of control and domination by human beings. Obviously, this makes the notion of autonomy depend on the existence or absence of "control" or "domination", concepts that must be defined in turn (and that the author, in fact, redefines in his own way) and that also Deep down, they make the autonomy of Nature depend on our species (anthropocentrism, after all). For the author, domination exists *only* when human influence is the predominant factor in determining an entity or natural process. Because, according to him, "All natural entities and processes have directions or trajectories, at least in the sense that they have beginnings, endings and patterns of change" and domination consists *only* in influencing predominantly in these processes. With which, Hettinger ends up suggesting a "positive" definition of the notion of autonomy, very similar in reality to the simple conventional notion: the possibility that a system develops its own behaviors or dynamics.[a] However, do they really develop own dynamics of *all* beings? For the author, paradoxically, even completely inanimate and static natural beings, such as a rock arch, would have them. However, a rock arch can form part of natural systems or be influenced by their dynamics, but it can develop few dynamics by itself (in this case, the author confuses the climatological and geological systems and processes that act on the rock arch with the arch itself, assigning to it dynamics that are actually characteristic of those). If the erosive processes are interfered with or counteracted, what would be controlled or what would lose its autonomy would in any case be these processes, not the rock arch that suffers them. The author overlooks these "little" details.

Another unconvincing aspect of the notion of "autonomy in relation to humanity" defended by the author based on the ideas of Jack Turner is the idea that the autonomy of beings or entities is reinforced by the influence or mutual interaction among them. It is one thing that autonomy does not necessarily imply absolute independence or isolation, and quite another that interaction or influence always reinforces autonomy. One cannot logically extract the other. It is a fallacy. Thus, following the "logic" of the author, and again paradoxically, dogs, which obviously constantly interact with human beings, would be much more "autonomous" than wild wolves, which normally avoid interacting with our species as much as possible.

Moreover, at least in the case of Hettinger, all this smacks too much of "newspeak" and artful manipulation of language: trying to redefine, twist and distort the meanings of terms so that they end up meaning even the opposite of what traditional and conventionally they have always meant, to confuse the staff and "take it to the author's ideological garden". If someone, as the author does in this case, says that this notion of "autonomy" directly proportional to the amount of interaction makes sense, they should either make him look at it or he is trying to stir the waters -obscure the meanings of the concepts- to obtain some kind of ideological gain (in this case: disguising what is really human domination of Nature as "respect for autonomy" in order to slip through the back door the idea that it is possible to reconcile the autonomy of Nature not Yet the

[a] Despite the fact that later it states that respect for the autonomy of natural entities should not refer to respecting properties of said beings such as autopoiesis or self-organization. Which is actually contradictory to this idea of respecting their "paths." existence, but even the development -"prosperity"- of any society or human activity).

Another unfortunate aspect of the author's arguments about "autonomy" is his use of examples of interactions between human beings to try to illustrate his ideas about the autonomy of Nature. Intraspecific human relationships are generally something completely different and alien to the relationships of human beings with non-human Nature, and the ethics that seeks to evaluate the latter must also be very different from the ethics that evaluates and regulates the relationships between beings. humans. It is not enough to equate both types of relationship and extend the circle of application of ethics between human beings to their relationships with Nature. The conditions, the valued entities and the values that must be used in both cases are neither the same nor comparable. In simple and clear Spanish, comparing, for example, the relationship within a marriage with the relationship between human beings and Nature is like comparing wheat to balls.

In fact, proof that the author's peculiar way of approaching the subject of the autonomy of Nature and the relationship of human beings with it leaves much to be desired is note 9 of the text itself, in which the author himself The author admits, more or less reluctantly, that his theory is failing. Although it seems that he ends up choosing to continue delving into the nonsense, instead of abandoning it.

In general, the author considers that the autonomy of Nature can only be reduced through "domination" or "control". However, this is a very simplistic way of understanding the notion of the autonomy of Nature and the threats to it. A natural entity can lose or see its autonomy seriously reduced without the need for anyone to dominate or control it. It is enough that their internal dynamics are affected or impeded in any way (often involuntary and indirect) for their autonomy to be reduced. For example, when the contamination of an ecosystem eliminates part of the organisms that constitute it, the structure and dynamics of that ecosystem (and its surviving elements) are seriously altered, and with it its autonomy, even though no one is trying to control it. or dominate said ecosystem when it pollutes it. And in fact, the results of altering the dynamics of natural systems are often precisely unpredictable, and therefore uncontrollable. That is why the terms "domination" or "control" are not always adequate to name certain attacks against the autonomy of Nature. Unless, as the author does, its conventional meaning (i.e., consciously and voluntarily influencing the dynamics of a system to cause it to develop or inhibit certain behaviors) is artificially stretched to encompass any way of predominantly determining the trajectory of a natural system.

Another serious flaw would be that, in the author's defense that human beings must have a "positive" role in Nature, a serious contradiction is implicit. This paradox lies in the dilemma that either human beings and their works are part of Nature or they are not. If they are considered to be, then the complete conceptual separation between Nature and humanity (or between artificial and natural -in the sense of non-artificial-) would effectively cease to make sense. But if they are not, then one wonders if it is possible for human beings to ever play a "positive" (or even merely non-negative) role *in* Nature, since for that they would have to be part of nature. Be that as it may, the author does not seem to have a clear position on the matter, since although on the one hand he speaks of playing "a positive role in nature", on the other, for him, humanity and Nature are separate entities that interact in the same way. equal, at the same level, not one as a mere part of the other.

The author says that "[partially artificialized][natural] entities are not wild nature, but, unless wildness is the criterion used to define nature, things can be nature and natural without being wild nature". This in principle is true. However, what defines and determines the natural character of something is its degree of artificialization (modification by human beings) not its autonomy. The autonomy of a natural entity (not artificial), what determines is precisely its wild character, not its natural character. However, Hettinger in his texts largely avoids talking about "wildness" or, as in this case, even insinuates that it is a secondary criterion, preferring to normally refer only to naturalness.) of natural entities; despite the fact that he considers his "autonomy" (or whatever he calls by that name) fundamental and that, therefore, in many cases (those in which he takes "autonomy" as a fundamental value), when he speaks of the "character natural" is actually referring rather to the wild character. This leads us to ask ourselves: why the author, despite apparently giving great importance to the autonomy of Nature, avoids as much as possible to speak of its "wild character" and

largely substitutes this expression for that of "natural character"? Or put another way, why can't and shouldn't wildness be the criterion used to assess (not "define") Nature? And the answer is obvious: Hettinger actually intends to justify and defend certain forms of domestication of Nature by human beings, such as traditional agriculture or "ecological" forest exploitation, something that the clear and explicit defense of nature wild nature as a concept and fundamental value would not allow you to do easily.

As for the sentence: "Rural lands and domesticated animals and plants -although they are much more influenced by human beings- can be as autonomous as wild nature"[b], it is another example of the confusion (or the confusionism) of the author around the concept of autonomy and wild character. Either the author confuses "savage" (that is, "autonomous non-artificial") with "virgin" ("intact") or else the author's concepts of "autonomy" and "savage character" are at least peculiar (and very different from conventional notions).

In general, in this text, as has already been said, the author continuously manipulates language for ideological purposes, for example, calling things in the same way ("natural character", "nature", "autonomy", etc.). different (naturalness is not the same as wildness; nature in general is not the same as wilderness in particular; autonomy is not the same as the absence of *only* certain forms of human interference or the presence of certain supposedly benign and "respectful" forms of domestication and influence, etc.) to make believe that they are the same thing.

Also the author on several occasions focuses on secondary aspects instead of focusing on the main thing, on the fundamental features. Like when he relates vulnerability to Nature with respect for its autonomy. This, again, at the very least means beating around the bush, confusing things unnecessarily and

[b] Or again: "Although it is obviously true that wilderness is less influenced by people than rural land, this does not imply that wilderness is more autonomous, as rural nature significantly affects people's lives in ways that the wilds don't." look at the finger instead of the moon. This relationship is neither as simple nor as direct as the author claims. It is not strange, then, that he reaches absurd and dangerous conclusions, such as that in certain cases of unavoidable vulnerability (lightning, inevitability of death, natural catastrophes), the roles are reversed and Nature "dominates" human beings (note 8). . What is the corollary that the author intends us to draw from this? That we have to tame Nature so that it does not "dominate" us? That we cannot be free (autonomous) if we do not get rid of that presumed domination by Nature? Although it is very possible that he himself is not aware of it or recognizes it, here it is clearly seen how the author, deep down, continues to be strongly influenced by basic progressive and humanist values (consideration of death as something absolutely bad; rejection of the limits, natural conditions and restrictions as something that, instead of allowing us to be truly free -autonomous-, prevents human "freedom" and "dominates" us; etc.) and, therefore, where his theory leads us: to a greater human control and influence in Nature. Of course, with a lot of "respect" and very "good intentions".

Finally, after what we have seen, it is difficult not to suspect that, to a large extent, for the author (and for many of the other "ecophilosophers" he cites in the text) it is more important to make philosophical filigrees, to theorize for the mere fact of theorizing, , engage in and maintain Byzantine discussions with their peers, etc. (and with it probably add to his professional and academic curriculum), than to try to have some real and practical influence on preservationist policies and on the real impact of human societies on Nature.

RESPECT THE AUTONOMY OF NATURE IN RELATION TO HUMANITY

By Ned Hettinger[c]

Preservationist environmental thinking involves the following ideas that are interrelated. The value of nature is essentially a function of its degree of independence from humanity. The natural or wild character[d] is what the value of nature is mostly based on. When markedly modified by human beings, nature loses much of its value and even its essential character. There is a strong conceptual separation between human beings and nature. Nature is to be understood in opposition to humanity; nature is non-human. Wilderness[e] is therefore the quintessence of nature.

[c] Translation by Último Reducto of "Respecting Nature's Autonomy in Relationship with Humanity", chapter 5 of the book *Recognizing the Autonomy of Nature*, Heyd (ed.), Columbia, 2005. *N. from t.* [d] "Naturalness or wildness" in the original. Although "naturalness" ("natural character", understood as "non-artificial character"), and "wildness" ("wild character"; that is, natural character plus autonomy) are not exactly the same, it is typical of Hettinger to equate them in his writings and predominantly use the term "naturalness". *N. from t.*

[e] "Wilderness" in the original. The English term "wilderness" lacks a simple translation in Spanish. It refers to areas or ecosystems with little or no humanization. Here, unless explicitly stated otherwise, it will be translated as "wild lands" or "wild areas". *N. from t.*

The most important form of respect for nature involves the preservation of wilderness, free from significant human influence.

In the context of the current massive and increasing humanization of the planet, these ideas contain a great deal of truth and are powerful. With perhaps half of the planet's surface significantly disturbed by humans and half dominated by them (Hannah *et al.* 1993), valuing nature for what remains of the wild[f], separating human beings from nature and preserving wilderness areas, is essential if we want nature, understood as "the independent other", to continue to prosper on this planet. However, these preservationist ideas, despite being very important, -by themselves and if not supplemented- have a dark side.

Most disturbingly, such ways of viewing the human relationship with nature make it difficult to imagine a positive role for humans in nature. If they are taken as the antithesis of nature, human beings necessarily degrade and destroy it. However, a proper environmental philosophy must explain how human beings can be anything other than an ugly scar or unsightly blemish in the natural world. Purely preservationist ideas also fail to offer guidance on how human beings should treat the nature with which they interact. Specifying how to value and respect lands that are not wild[g] (and animals and plants that are not totally wild), including the rural, intermediate or productive landscape[h], is also a crucial task for environmental philosophy. At best, pure preservationists tell us to minimize our use of said lands and beings. At worst, preservationists see such land (and the animals and plants that inhabit it) as human-made artifacts and totally worthless. However, an adequate conception of the relationship between human beings and nature must allow for the possibility of a respectful *use* of nature.

I believe that a certain concrete conception of the autonomy of nature offers an important resource to respond to these challenges. Preservationist intuitions need to be linked to the idea of respecting the autonomy of nature. A healthy respect for the wildness of nature that has not been significantly influenced by human beings combined with a respect for the autonomy of nature in which human beings are involved offers an ethic of respect for the autonomy of nature much more adequate and complete than any other ethic does on its own. This essay explores the concept of respect for the autonomy of nature and relates it to preservationist intuitions.

Problems of pure preservationism

Many environmental philosophers, including some of the most influential, accept some version of these preservationist ideas and are vulnerable to the criticisms I have just mentioned.¹ For example, Paul Taylor's interesting book *Respect for Nature* (1986) deals only with respect for wild nature and intentionally leaves out of the discussion how to properly treat nature that has been intensively used to satisfy human ends. To this kind of nature Taylor

[f] "Wildness" in the original. *N. from t.*

[g] "Nonwilderness lands" in the original. *N. from t.*

[h] "Working landscape" in the original. See "Why the productive landscape does not work" [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/por-qu-el-paisaje-productivo-no-funcional>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/por-qu-el-paisaje->][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocentric/why-the-productive-landscape-doesn't-work>][productive-doesn't-work]] in *Naturaleza Indómita. N. del t.* he calls "bioculture" and, according to him, it is "part of human civilization", not of nature (310). Although Taylor believes that developing an "ethics of bioculture" is an important task, he

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

believes that it is not properly part of environmental ethics. This is unfortunate, since an ethic of how human beings should treat the nature with which they live and work is of vital importance and is a central (albeit too often forgotten) task for a philosophy dealing with the relationship human with nature. In addition, one of Taylor's fundamental rules for respecting nature is the duty not to interfere: "We must not try to manipulate, control, modify or 'manage' natural ecosystems, or intervene in any other way in their normal functioning" (175). We are "required to respect their wild freedom and leave them alone" (176). Although the duty not to interfere with wilderness is enormously important, suggesting that any kind of human modification - or participation - in nature violates *prima facie* a duty to nature makes it difficult to conceive of a positive notion of the human relationship with nature.²

Nor does Eric Katz's conception of the value of nature and of our obligations towards it leave much room for a positive idea of the relationship between human beings and nature. His characterization of the human-nature relationship suggests that any human use of nature is abusive. Katz says, "When human beings shape and manipulate the natural world to suit their own interests, to satisfy their desires, that is a form of anthropocentric domination , the oppression and denial of the autonomy of nature." (Katz 1997;xxiv). However, human beings, like all other species, must influence the natural world. Human survival requires it; not to mention human prosperity. Katz's language suggests that human beings -by their very nature- dominate, oppress and subvert the autonomy of nature. For Katz, even well-intentioned human involvement in nature - such as the restoration of degraded nature - is oppressive. Katz writes, "The reconstructed natural environment that is the end result of a restoration project is nothing more than an artifact created for human use" (97), and although "these restored and redesigned natural areas appear more or less natural . . . they will never be natural" (98). For Katz, therefore, the human stain on nature is so toxic that once nature has deteriorated, it is ruined forever; will never return. According to Katz, it seems impossible to imagine an environmentally just future in which human beings live in the natural world in a morally appropriate way.

Sometimes Holmes Rolston's ideas about nature approach these same kinds of problems. In a forceful response to J. Baird Callicott's (1991) critique of the idea of wilderness³ as uninhabited places and Callicott's suggestion that the interaction of humans and nature could benefit this, Rolston says: "the fallacy is to think that nature supposedly improved by human beings is still totally authentic nature" (Rolston 1991:371). This comes very close to the claim that only virgin nature[j] is true nature. Such a way of seeing things leaves no place for human beings in nature. Although Rolston sometimes writes about rural nature, he considers it a "hybrid" between nature and culture (Rolston 1988:330), suggesting that authentic/pure nature has been degraded in rural landscapes. Furthermore, Rolston has a decidedly "compromising"[k] view of

² Original title: *The Vanishing face of Gaia*.

³ "Wilderness" in the original. *N. from t.*

the interaction between humans and nature. Although on several occasions Rolston suggests that human beings could add to the value of nature, the dominant story in his thinking is that human interaction with nature is a loss for nature. To prosper, human civilization must sacrifice natural values to achieve cultural values (Rolston, 1994:85-86). While there is much truth to this view, it is important to consider those kinds of human flourishing that do not need to compromise the value of nature.

If we accept the unsettling idea that "nature can only be fully itself, and therefore have all its value, when it has not been disturbed by human beings" (Katz 1994:71), what we are left with is the unfortunate suggestion that - from the perspective of the value of nature - a human/nature apartheid⁴[1458][1460] policy would be best. In the context of the current damaging human transformation of the planet, apartheid *is* very much what is needed. Leaving much of Earth's nature alone is an absolutely central part of any proper environmental ethic. However, this is not all that is needed, and an environmental ethic that suggests that nature necessarily loses or ceases to be nature in any meaningful exchange with human beings makes the human presence on Earth a tragedy for terrestrial nature. . Environmental philosophy must ultimately articulate a constructive human-nature relationship that allows us, as John Visvader says, "to imagine that we can give the world around us something more than the gift of our mere absence" (1996:18) . . The alternative of either minimizing influence on nature (Katz's ideal of human/nature apartheid) or sacrificing the value of nature for human good (Rolston's idea of "compromise") fails to provide such a role. positive.

For human beings to have more than a purely negative and damaging role in nature, we need to distinguish between human *participation* in nature and human *domination* of nature. nature. The *modification* and *alteration* of nature must be differentiated from *mastery* and *control* over nature. If we define human alteration of nature as a degradation in itself, human beings who wish to be respectful of nature will not be able to interact with it at all. It appears that activities such as bird watching from a distance would constitute the maximum permissible interaction. Related to this, it is necessary to explain that certain types of human uses of nature are not necessarily abusive and that human beings can use nature as a means without necessarily using it only as a means. If our use of other human beings is not necessarily devoid of respect for them, it can be expected that our use of nature is not necessarily devoid of respect and concern for its prosperity either. A positive view of humanity's role in nature might imply a partnership relationship between humans and nature, in which humans use nature respectfully while nature does not lose and perhaps even gains from the interaction. The ideal is a symbiotic, mutually beneficial relationship with nature.⁵ Such an ideal should supplement, not supplant, a preservationist ethic that requires meaningful separation.

⁴ The term of Afrikaans origin "apartheid" literally means "separation". This is the sense with which

⁵ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

Types of autonomy from nature

A particular way of understanding respect for the autonomy of nature could offer a means of dealing with these issues. Autonomy is a form of independence that is different from absolute independence (ie avoiding influence as much as possible). Respecting the autonomy of others does not mean avoiding interaction with them or influencing them. What respect for autonomy requires is that one does not dominate or control the other. Therefore, the autonomy of nature is not necessarily threatened by human influence, as long as this influence is not dominating, just as the autonomy of a person is not necessarily compromised by the influence of others, as long as they avoid dominating and controlling that person. Jack Turner comments on a related issue thus: “Although autonomy is often confused with radical separation and complete independence, the autonomy of systems (and I would add human freedom) is enhanced by interconnections, interaction... m] elaborated and feedback-that is, by influence” (1996:113).

It is clear that nature is not autonomous in some of the senses in which people are autonomous. With the possible exception of psychologically sophisticated animals, natural entities or systems do not evaluate the range of possible alternatives or intentionally choose a plan of action. Nor is the activity of natural entities autonomous in the sense that we might be justified in holding them morally responsible for their behavior. Still, the behavior of natural entities can reasonably be described as autonomous in certain respects. Human activity can be seen, in these cases, as something that either prevents or respects the autonomy of nature.

The most fundamental sense of the autonomy of nature is freedom from human domination and control. Let's call this autonomy of nature in relation to humanity. This is a purely negative sense of autonomy and consists in the absence of a certain type of human influence on nature. Autonomy in this sense is a relational property between natural entities and human beings. To say that nature is autonomous from humanity is to say that nature goes on regardless of human control or domination. Human beings dominate nature when they exercise dominance over it by exerting a supreme determining or directing influence. When human influence on a natural entity or process outweighs all other determining factors, humans are dominating that entity or process and failing to respect the autonomy of nature in relation to humanity. For example, regulating the height and frequency of a geyser by means of the systematic application of soap in its underground conduits undermines the autonomy of the geyser, since humans are then the main determining factor of the geyser eruptions. In contrast, watering a tree to make it grow faster and bigger (or shading it with your own house and thus slowing down its growth) does not dominate the tree, despite constituting a significant influence on it.

To respect the autonomy of nature in relation to humanity is not to respect nature by virtue of particular properties that it possesses, but to treat it in a certain way. We respect the autonomy of nature when we avoid exercising preponderance when it

comes to influencing it. Human beings can respect the autonomy of nature in this sense whether the natural entity acts on a goal-oriented basis (for example, organisms and perhaps some ecosystems) or not (for example, rocks and mountains), whether the natural entity is either quite active (such as a river) or relatively passive (such as a pond). A natural stone arch about to collapse due to man-made acid rain has seen its autonomy undermined as much as a sequoia whose life cycle has been cut in half by a tunnel dug through its trunk for a road to cross. , although the former is not a self-organized or teleological being. In both cases, human beings dominate these natural entities by exercising the preponderance in influencing their destinies. Similarly, preventing a natural arch from collapsing as a result of wind and water erosion by using metal cables and screws puts human beings in control of the arch's fate and does not respect their autonomy from humanity.

All natural entities and processes have directions or trajectories, at least in the sense that they have beginnings, endings, and patterns of change.⁶ Human beings can participate in and influence these processes while respecting the autonomy of the entities in which they manifest themselves by avoiding a controlling or dominating influence. For example, the reproduction by humans of the natural fire regime in a fire-adapted forest implies a significant participation of humans in the natural system that, however, does not constitute domination or dominion over it, in part because the general trajectory of the system is not altered. Selective felling of trees of different ages that preserves species and forest successional processes could also be compatible with the autonomy of the forest from humanity for similar reasons. Affecting the deer population and the predators that feed on them through subsistence hunting influences this predator/prey system without necessarily controlling it. By contrast, regulating deer and predator numbers through scientific management of hunting seasons, control of deer birth rates, or systematic predator poisoning comes very close to mastering this predator/prey relationship and , therefore, does not respect the autonomy of natural processes.

It has sometimes been suggested that if human beings are a necessary condition for an entity to exist, then the entity is ontologically dependent on them and therefore lacks autonomy in relation to humanity (Katz 1997; Lee 1999). Domesticated animals and plants would not exist were it not for humans, and therefore, he makes this argument, they are dominated and controlled by humans. This critique could be applied to contemporary agriculture, but it is too broad. According to this argument, all agriculture, whether it is carried out ecologically and on a small scale or it is industrial agriculture based on chemical products, is disrespectful to nature. According to my argument here, human beings dominate a natural entity when they have the upper

⁶ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

hand in influencing it. That someone is a necessary condition for the existence of something does not imply per se that that person or persons exert that kind of influence on it. Parents are necessary conditions for the existence of their children but may not exert that kind of influence on them. Many species on the planet -including those that exist in protected wild areas[n]- have human tolerance as a necessary condition for their existence. But this is not supposed to dominate them. Therefore, the fact that human beings are a necessary condition for the existence of some aspects of nature does not necessarily mean dominating or showing a lack of respect for their autonomy in relation to humanity.

There are other conceptions of respect for nature that, unlike autonomy in relation to humanity, suggest that we could and should respect natural entities and systems because they have specific properties or capacities. Respect for the autonomy of nature could mean respecting the self-organizing and autopoietic systems of nature or it could mean respecting those natural entities and systems that are powerful, active, resistant or resilient in the face of human-induced changes. A wild river actively and powerfully resists human attempts to change its course or flow. North America's rainy east is much more resilient to human impacts than its dry west, and a granite butte is more resistant to mountain biking than its surrounding brittle desert. If respecting the autonomy of nature means respecting natural entities and systems by virtue of their properties, then, strangely, those dimensions of nature that lack those characteristics will not be worthy of such respect. Asking for respect for the autonomy of nature in these senses would also lead to other counterintuitive results, since it is the least powerful, most delicate and most easily influenced aspects of nature (those entities and processes that are least autonomous) that need more attention. protection. One of the virtues of respecting the autonomy of nature in relation to humanity is that it does not make this type of discrimination between natural entities.

Nature influencing human beings

The fact that human beings dominate an entity or natural process (and, in this sense, we do not respect its autonomy in relation to humanity) not only depends on the enormous degree of influence that we have over it, but also on whether that entity/process in its Sometimes it influences us. Consider that although husbands exert a high degree of influence on each other, they do not normally dominate each other. That same amount of influence exerted over an acquaintance would most likely be considered dominance. We will be much less likely to judge a high degree of influence over one another to be dominance when there is substantial counterinfluence as well.[1461] The autonomy of nature is thus dependent not only on the amount of influence that human beings have over nature but also on the degree of influence that nature has over human beings. When a natural system or entity plays an important role in what happens in human culture, that is, when it exerts a significant influence on our lives,

a substantial influence of human beings on that natural entity is much less likely to involve domination and much more likely to be compatible with respecting the autonomy of nature in relation to human beings than when the natural entity exercises little or no influence over humanity. In human affairs, when two people exert significant non-dominant influence on each other, it is a sign of a healthy relationship. Such mutual influence is a similar sign of health when present in the human relationship with nature.

This dimension of respect for the autonomy of nature that mutual influence supposes can help us see certain types of human relationships with rural nature from a positive perspective. Let's contrast human interaction with rural landscapes and human interaction with wilderness. Many preservationists would say that humans significantly dominate rural lands, while wildlands have autonomy from humanity. This is not necessarily the case, if we take into account the previous definition of autonomy. While it is obviously true that wilderness is less influenced by people than rural land, this does not imply that wilderness is more autonomous, as rural nature significantly affects people's lives in ways that wilderness is not. they do.⁷ Often, the people who work with rural nature live thanks to the rain, the soil, the sun, the animals and the plants. Instead of letting a banker, a boss, or the stock market determine their lives, they let the seasons, the temperature, and the presence or absence of predators or pests. Rural nature can retain its autonomy in relation to humanity even when it is significantly influenced by human beings, since it can in turn substantially influence us.

It is true that a farmer might have machinery, chemicals, irrigation systems, greenhouses, insurance, and so on, so that he would be hardly more influenced by nature than an urban dweller would be. However, some farmers put their livelihoods in the hands of nature. They depend on rain to come instead of irrigating with fossil water. They rely on hedge-dwelling insect predators instead of relying on chemical pesticides. They rely on hawks to keep the vole population down. They depend on horses to plow and fertilize the fields. By remaining open to significant influence from natural entities and systems, it is very likely that your relationship with nature will be of a non-dominating type.

One of the implications of this way of understanding things is that, if we want to respect the autonomy of nature, it will help not to protect ourselves too much from it.⁸ Sometimes we can work to respect the autonomy of nature by remaining or making ourselves vulnerable to nature.⁹ Conserving or restoring predators is one way to do

⁷ A couple of examples:

⁸ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

⁹ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial

this. When rural people must remove their bird feeders, properly seal their garbage, walk with bells or avoid certain walks because of bears or mountain lions, they are vulnerable to the influences of nature and therefore much more likely to interact with an autonomous nature. Reintroducing wolves to the rural landscape that could eat our sheep forces us to change our farming practices, adds influence from nature to our lives and reduces our control of the situation; therefore, it is very likely to increase the autonomy of local nature in relation to humanity. When human beings adapt to natural processes and entities instead of reshaping or eliminating those processes or entities, they show respect for the autonomy of the nature with which they live.¹⁰

system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹⁰ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out* , page 237).

Presentation of “Human beings and the value of the wild”

The following text addresses, in a relatively original and interesting way, a series of conflicting points around the concept of the wild and the positions, often opposed, that many people interested in the relationship between human beings and Nature usually raise in this regard. . Unfortunately, the author, Bill Throop, is not very good at using language to express his ideas simply and clearly (this has been tried to improve as much as possible in translation, but still some sentences are still too convoluted). So we will offer below a summary of the article’s argumentative thread, to facilitate its subsequent reading:

According to the author, with regard to the relationship that human beings must maintain with Nature, there are two sides, largely opposed. On the one hand, there are the preservationists, who usually defend that what is human and wild Nature are different and even opposite entities that must be kept separate in order to preserve what remains of the latter. On the other, the “integrationists”, who based on the assumption (up to a certain point true) that the human is also part of Nature, consider that the way to prevent the destruction of Nature from advancing is to recognize the fact that what is human is also natural and integrate our species and its works in Nature in a “sustainable” way (or vice versa), and not (so much) declare strictly protected natural spaces, since the latter, according to them, artificially separates beings humans of Nature.[a]

The author tries to overcome this conflict, analyzing various ways of understanding human beings as part of wild Nature and the limitations of each of them.

To begin with, he posits three principles or conditions that must be fulfilled by any description of human beings as wild or natural beings[b]:

- a. It must refer to characteristics that have intrinsic value in human beings.
- b. It must be consistent with the value of wild ecosystems.

[a] In principle, this conflict is the theoretical context in which many other texts published in the section “Texts on the concept of Wild Nature and ecocentric theory” are situated.

[<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica>][(<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica>)], in this very *web page*).

[b] The author, although he opts for the *term* “wild” (“Where I speak of ‘wildness’, others speak of ‘being natural’. I prefer the first expression since sellers of food and

vitamins have not yet appropriated it and it has an air less generic than 'natural'"), it does not seem to be *always* very clear about the difference between the *concepts* of "natural" and "wild". Thus, on the one hand, it says that "wildness is a function of the degree to which an ecosystem has not been altered or controlled by human beings", that is, the wild is that part of Nature that is autonomous and follows its own dynamic; but on the other he says that "a characteristic... will be wild to the extent that it has not been caused by humanized environments", that is, that the wild, according to him, is everything that is not artificial, that is, the wild is the same as the natural. However, in reality, "natural" refers only to the origin of certain things (anything that has not been created by human beings; that is not artificial), while "wild" refers to the operation of only some (in reality, most) of natural things (those that work autonomously; that follow their own dynamics and processes).

c. It must be consistent with current biological and historical knowledge about human beings.

Then he goes on to raise and successively assess four ways of understanding and describing the wild character in human beings (each one of them, supposedly, replaces, specifies and improves the previous one):

1. Human savagery as human traits and behaviors caused by non-human conditions.
2. The human wild character as spontaneous human traits and behaviors (not reasoned or deliberate).
3. The human wildness as unconventional human traits and behaviors.
4. The human wildness as human traits and behaviors not caused by humanized environments.

And he ends up concluding that, according to him, (4) it is the most satisfactory way of presenting the savage character in human beings, although not without certain nuances:

(i) The value of wildness in humans can be overridden by other values. For example, according to the author, technological development may be more important than maintaining the wildness of both ecosystems and human beings.

(ii) The value of the wild character is contextual, that is, it depends on the context and circumstances: especially its value seems to be in inverse proportion to its abundance or prevalence. Thus, if the savage predominates over civilization, the savage character loses value compared to civilized traits and vice versa. According to the author, there must be a balance between the two.

(iii) The value of wildness is systemic, that is, wildness must be accompanied by other properties to have value.

Finally, after having made a fool of himself throughout the text, pretending to offer a solution or at least clarify things regarding the conflict between preservationism and "integrationism", he ends up leaving us more or less as at the beginning, saying that the solution is to preserve certain wilderness areas and "sustainably" develop the rest. Of course, it does not even tell us how it would be possible to do this, if it were.

As we already pointed out in the case of another text by a colleague of Throop[c], when “philosophers” set out to clarify things and enlighten us, they often end up muddying everything even more. Or at least, as in this case, they do not really clarify much or provide any solution.

Here are some of the shortcomings of this text:

The main error is that the conflict between preservationism and what the author calls “integrationism” does not have so much to do with the underlying philosophical position about the belonging or not of human beings to Nature, as with the usual rejection or disdain on the part of the “integrationists” of the notion of the wild (the

[c] “Respect the autonomy of nature in relation to humanity”, by fellow philosopher Ned

Hettinger:[<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/respetar-la-autonoma-de-la-naturaleza-en-relacin-con-la-humanidad>][<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/respetar-la->

[<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/respetar-la-autonoma-de-la-naturaleza-en-relacin-con-la-humanidad>][autonoma-de-nature-in-relation-with-humanity.] autonomous non-artificial) and, above all, of its intrinsic value. Or put another way, preservationists tend to be ecocentric, while “integrationists” tend to be more or less openly anthropocentric humanists. Then, the solution to this ideological conflict, if there is one and it is worth looking for, does not involve finding ways to define the savage character that are compatible with “integrationism” (which is what the author has tried to achieve, more or less). minor success, in this text). In reality, the author, as a “good” philosopher, is going off on a tangent so as not to have to openly position himself for one of the sides and thus be able to give a false appearance of impartiality (actually it is obvious that he is on the side of the other). preservationism; and, by the way, this is one of its virtues); an old trick often used by intellectuals, politicians and other charlatans to make their interlocutors drop their guard.

In addition to this fundamental flaw, some of the author’s assumptions should be seriously questioned:

- Throop seems to accept the “integrationist” premise that, “from an ecological perspective, human beings are members of ecological communities, they are interdependent with respect to other members of communities.” It is understood that “ecological communities” refers to natural and wild ecosystems. But if so, how are civilized human beings part of such savage ecological communities? And how are wild ecological communities dependent on civilized humans? It is true that human beings, civilized or not, depend on Nature to continue to exist (air, water, food, resources, energy, space), but not vice versa: Nature does not need us. Rather to the contrary, the existence of civilized human societies inevitably destroys and degrades Nature, and Nature does much better off without them.

- The author assumes that Paleolithic hunter-gatherers and their behaviors were "savage", but if Nature (or the natural) is that which is not artificial, and if the wild is the natural that is autonomous, then to what extent Can we say that human beings (civilized or not) and their behaviors are "natural" or "savage"?

- The author, as usual, confuses (positive) value with kindness, and they are not necessarily always the same. The (positive) value of something may simply lie in the fact that it is not bad, even though it is not good either. In fact, this is what happens in the case of Nature.

- The author considers that the value of the presumed benefits that technology brings to human beings can equal or exceed the value of wild Nature, that the wild and industrial civilization can coexist in "balance", or even that the latter can be developed "sustainably" without damaging the former. These are unacceptable positions for anyone who *really* takes the value of wildness as a fundamental value[d] and denote that the author still needs to clarify many aspects of his own theory. Basically, he should decide whose side he is really on: Wild Nature or techno-industrial society.

[d] If only for their practical implications: when push comes to shove, they will *always* involve betraying Nature in favor of technological development.

- The author affirms that the value of the wild is (and must be) intrinsic, but at the same time he says that it is contextual. However, if the value of the wild character is contextual, then it is not intrinsic. An intrinsic value, by definition, is absolute, objective, inherent, and independent of context. If its existence depends on who assumes it (or if someone assumes it), on circumstances (for example, its abundance or rarity), on other values, etc. it is no longer intrinsic, but extrinsic, relative and/or subjective.

- The difference (if there really is one) between descriptions (1) and (4) of the human savage character offered by the author is not at all clear. What is the difference between "conditions in which no human beings intervene" and "non-humanized environments"?

Despite these flaws and inconsistencies, or perhaps in part because of them, the article at least serves to reflect, among other things, on the concept of wildness, the limits of its applicability to human beings, and the validity and limitations of existing theories about the relationship between human beings and wild Nature.

Human beings and the value of the wild[1,e]

By Bill Throop

"How close to good is that which is wild."

—Thoreau

There is a branch of environmental thought that tends to emphasize the preservation of relatively wild land and the restriction of human use of that land.¹ A contemporary

¹ Original title: *The Vanishing face of Gaia*.

radical manifestation of this strand is the Wildlands Project[f], which proposes that approximately fifty percent of the United States be protected as protected wilderness[g]. Preservationists are often motivated in part by the belief that wild ecosystems are valuable by virtue of their wildness[h], where wildness is a function of the degree to which an ecosystem has not been altered or controlled by beings humans.

This motive for preservation has been the subject of strong criticism by those who defend the paradigm that tries to integrate humans into nature rather than separate them from the wilderness. We will call the latter integrationists. Integrationists, such as Baird Callicott (1991) and William Jordan (1994), argue that it makes little sense to value nature for its independence from human beings.

[e] Translation by Último Reducto of “Humans and the Value of the Wild”. Original published in *Human Ecology Review* 3, no. 1, Autumn, 1996. *N. from t.*

[f] Former name of the American conservation organization “Wildlands Network”. *N. from t.*

[g] “Wilderness preserve” in the original. “Wilderness” in English refers to ecosystems or areas with little or no humanization in which natural processes develop autonomously. In this text, unless otherwise indicated, it has been translated as “wilderness areas” or “wilderness areas”. *N. from t.*

[h] “Wildness” in the original. This is the translation that will be used throughout this text. *N. of t.* humans since, according to our best scientific theories, human beings are part of nature completely. From an ecological perspective, human beings are members of ecological communities, they are interdependent with respect to the other members of the communities. From an evolutionary perspective, human beings are highly adapted beings that arose through natural selection. Since human beings are part of nature in these senses, it seems problematic to base an environmental program on values that presuppose that human beings are separate from the rest of nature.

The debate between preservationists and integrationists has often been complicated by a failure to clearly distinguish between the various senses in which human beings are or are not “part of nature” and to identify which of these senses signal important differences in value between human beings. the wild and the humanized.² When the diversity of such meanings is pointed out, preservationists are often quick to respond to the objection. Distinctions between values need not be based on scientific distinctions, as is clearly seen, for example, in the valuation of works of art. Therefore, the charge that the distinction between human beings and nature is not based on scientific theory is irrelevant. This answer is not completely satisfactory, however. Preservationism, to the extent that it is based on the value of wilderness, seems to presuppose that there is a sharp line separating humans from the rest of wild nature, since anything altered by humans becomes less wild. Human beings have just the opposite of the Midas touch.

² Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

However, human beings were certainly savages in their day, and may still be in some respects. A complete answer to the objection of the integrationists would have to show how human beings passed from a state of the wild to a relatively domestic state; this should blur the line between humans and the rest of nature.

Here I will try to give such an answer by defending a notion of savagery in human beings according to which a human characteristic will be savage to the extent that it has not been caused by humanized environments. I am not going to repeat here the arguments in favor of preservationism or the value of wildness in general.³ As almost everyone involved admits, at the political level the preservation/integration problem is really more a matter of emphasis than of opposing alternatives. My rearguard action, dodging the integrationist accusations, will make the implications of preservationism for environmental policies appear somewhat closer to those of the integrationists than would otherwise be the case, even though their reasons for such policies remain quite different.

I will distinguish several principles that order human actions and characteristics according to the degree to which they differentiate human beings from the rest of nature. I will assess these principles based on three criteria: (a) the degree to which they identify some property of wilderness that is likely to carry intrinsic value when presented by humans, (b) their consistency with possible consideration of the value of ecosystems wild and (c) its consistency with current biological and historical knowledge of human beings.

Wherever I speak of "wild character" others speak of "being natural". I prefer the first expression since it has not yet been appropriated by food and vitamin sellers and it has an air less generic than "natural". It also emphasizes the drastic change in values that led to the rise of the preservation movement, since before the 19th century "wild"[i] had a negative connotation.

"Wild" has various meanings that intermingle with each other; the Oxford English Dictionary identifies 15 different meanings. This poses a problem for conceptual analysis. One can carry out the analysis of a term by appealing to intuitions about in which cases it is applicable only when a concrete use has been isolated by an intellectual tradition. There is no such tradition for "savage," so such insights have only rhetorical force, underscoring a particularly important or useful sense of the term. In any case, some of the uses of "wild" obviously constitute an inadequate basis for the preservation of ecosystems. Wildness is often associated with being fierce, undisciplined, restless, or disorderly[j]. Although some of these characteristics may be valuable in human beings - Thoreau (1863/1993) speaks of the "terrible fierceness with which good men and lovers

³ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

come together” - they bear only an occasional resemblance to the wild character that one wishes to preserve. in ecosystems.

Criteria (b) and (c) suggest some general restrictions on the type of wild character that is relevant here. The wildness that preservationists emphasize is a historical property of some ecosystems (Elliot, 1982); identifies a particular genesis of ecosystem features; very *roughly*, their appearance primarily as a result of non-human forces. This suggests that for a description of the savagery of humans that fits with the savagery of ecosystems to be relevant here, it must imply the historical ownership of some traits of humans.[928] Since the wildness of ecosystems is a matter of degree, the same could be expected of the wildness of human beings. Intuitively, a mature forest[k] seems wilder than a fallow field, which is wilder than an Iowa cornfield today, and this one is wilder than a parking lot. Similarly, many features of Paleolithic peoples were more savage than analogous features of early farmers, and more savage still than those of modern city dwellers. A description of the savage character of human beings that fits our biological knowledge must show how completely savage beings became less savage. Possibly it should be adjusted to the phylogeny of human beings and also to their ontogeny, especially in those cases of “feral”[929]⁴[931][932][933] children who were later reintegrated into a culture.⁵ Any such description will acknowledge that highly instinctive behaviors are at the wild end of the continuum, having evolved as part of the repertoire of early humans who were predominantly wild.

I will evaluate four possible descriptions of wildness in humans. They will be formulated using variables that encompass different behaviors (ie types of activities) and characteristics. One can speak as if an organism were wild in its entirety; however, some beings can be wild in some ways but not in others. Different historical properties may apply to different characteristics of the same organism. Therefore, it seems preferable to speak of the wildness of the characteristics themselves. Descriptions should be interpreted as ways of identifying general properties of the wild character, not as ways of exactly defining “wild character”. It is doubtful that our values supervene from[m]precise empirical properties, since this is not a requirement for the purposes served by valuation. My goal is to achieve a degree of precision sufficient to intuitively isolate different notions of wildness that might be candidates for a description of wildness in humans.

I’ll start with a description that simply assigns to human beings the kind of wild character that we value in ecosystems.

(1) The wild as nonhuman: x is wild to the extent that humans play little or no role in the causal conditions that give rise to x.

Although some ecosystems are quite wild in this sense, few if any human features or behaviors would be wild, since humans play a significant role in the genesis of their features. By this description , the hunting and gathering behaviors of Paleolithic

⁴ “Feral” in original. In English “feral” refers mainly to those living or

⁵ A couple of examples:

humans would be about as savage as the food-gathering behaviors of a factory worker or television newscaster, since humans play the game. major role in causing both types of behavior. These types of consequences serve as fuel for the criticisms that integrationists level against preservation.

A tempting alternative is to define savagery in terms of the absence of deliberation, following the traditional idea that reasoning is what differentiates human beings from the rest of nature.⁶

(2) The wild as spontaneous: x is wild to the extent that x is the result of spontaneous processes (that is, it is not the result of reasoning or deliberation).

This is a move in the right direction. According to (2), behaviors that are largely instinctual are largely wild and the physical characteristics of human beings that are a function of the interaction between the elements and our genetic inheritance, such as the color of our skin and our physiognomy, are largely savage. What's more, computer programming and philosophy carry little wildness. However, (2) also has some less fortunate consequences. Spontaneously turning on the TV or habitually obeying complex rules of etiquette would become examples of wild character. However, these and many other spontaneous activities are embedded in highly complex and artificial behavior patterns that seem to be the antithesis of wild nature. Furthermore, the reasoning involved in planning and coordinating a Neolithic[n] mammoth hunt does not seem to diminish its remarkable savageness. We have pointed out that instinctive behavior implies wildness, presumably because it is the result of our biological nature, which we share with our wild ancestors. However, reasoning seems to be something that is also part of our biological nature. It could be said that the ability to reason is largely the result of natural selection acting on the first hominids. Since natural selection is an important part of the stories that create wildness in other members of an ecosystem, its effects on hominids should be wild.

Another common suggestion identifies wildness with being free from artificial conventions. Recounting his trip to Mount Greylock, Thoreau (1863/1993) appreciatively describes a country farmer who lacked the civility and social good manners of Concord[o]: "He was in fact as rude as a fabled satyr. However, I let him be himself, should I fight with nature, and I was even pleased to have discovered such a natural phenomenon. Although Thoreau is juxtaposing the natural and the conventions of well-mannered society, our principle can be stated more broadly.

(3) The wild as unconventional: x is wild to the extent that x is not caused by human conventions.

This principle has many of the virtues of (2) and avoids some of its vices, since it further narrows the scope of the wild to exclude spontaneous reactions to all kinds of norms. Here, however, it fails in the opposite direction by making too many actions

⁶ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

non-wild. Conventions seem to vary considerably in their distance from the "natural." The rules of etiquette adopted by the 18th century French nobility seem much more artificial than the conventions of word meaning. The actions caused by the former seem much less savage than the verbal behavior that hunting a mammoth would imply. If the earliest human activities were largely savage, and if linguistic conventions played a significant causal role in some of them, then convention cannot itself be the arbiter of savageness. We need a definition of wildness that distinguishes between different kinds of convention, and that does not do so solely through a circular appeal to "artificial" conventions.

I suggest that explaining savagery in humans in terms of the environments that cause it allows us to make such a distinction. Consider the following principle:

(4) The wild as "coming from nature": x is wild to the extent that x is not caused by humanized environments.

This proposal is built on a description of the wild nature of ecosystems, as was the case with (1), which can serve as support for preservation. As we have seen, an ecosystem is wild to the extent that it is not altered or controlled by human beings.⁷ If an ecosystem has value in part as a consequence of its wilderness in this sense, then wilderness is a basis for preservation. The intuition behind (4) is that human behaviors and characteristics are savage to the extent that they are caused by savage environments or by humans who are themselves savage to a significant degree.

Like other genetic predispositions, our tendencies to use language and reason are wild, having been selected on the basis that they suited humans to wild environments or other humans who were largely wild. Therefore, behaviors that are largely instinctive have a significant wildness. My speaking a particular language, let's say English, means that I have to use conventions that are largely caused by humanized environments, so the particular forms that language takes are not very wild.

Conventions vary, however, to the extent that they are responses to non-humanized environments. In general, highly complex and artificial conventions seem to develop out of simpler conventions that are responses to biological and environmental needs. According to (4), the latter tend to be wilder than the former, just as expected. Intuitively, as the spiral of human behaviors that transform the environment and in turn react to those transformed environments unfolds, our wildness diminishes; we become more and more the products of our own creation. Nowhere is this more evident than in the development of technologies. As our behavior is increasingly determined by the spiral of basic needs that lead to the production of technologies that in turn alter those needs, contributing in turn to the emergence of new technologies, we are losing our

⁷ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

residual savageness. The excessively consumerist spiral of television purchases -ads- as entertainment is one of the most notable examples of this.

Of course, sometimes highly humanized environments produce a rejection of humanization, a return to the countryside or to simpler, less technologically sophisticated ways of life. Some of today's environmentalism and much of nineteenth-century romanticism involve these kinds of reactions. According to (4), these would apparently lack significant wildness - a highly unlikely result. This supposed counterexample is structurally analogous to another dilemma regarding ecological restoration. Intuitively, an ecosystem that has been humanized often returns to its wildness more quickly when it is restored to a "natural" state, even if the restoration involves more human activity. Paradoxically, some human activities reduce the humanization of a system. A theory of restoration must explain this. One of these theories links the speed at which humanization disappears from a system with the degree of similarity between a pre-humanized state and the current state.⁸ Similar moves are needed to avoid the aforementioned alleged counterexample. Some humanized environments produce human activities similar to those that would have been caused in the absence of such humanization. In such cases, the effects of humanized environments on behavior fade and humans become more wild.

The fourth principle seems to place factory farm and Pepito's farm[p] along a continuous gradient from wildness in just the way one might expect. Normally the practices of the latter are much more conditioned by the demands of the local environment than those of the former. It also appropriately places hunting practices based on the technologies they use and the degree to which they are motivated by the need to obtain food. In general, Paleolithic peoples would turn out to be much more savage than modern humans, since more of their behaviors and characteristics would be largely caused by wild environments acting in conjunction with genetic predispositions. Agriculture would represent a very important change in the human wild character, since it would significantly transform the territory to which human beings responded; and industrialization would represent another significant change. The adequacy of these implications suggests that (4) identifies a common notion of savagery as applied to human beings. As we have seen, (4) fits well with a description of the wildness of ecosystems, and fits

⁸ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out*, page 237).

with much of our biological and historical knowledge of humans. The only condition that remains to be satisfied is that the wildness be a value carrier. Will those behaviors and characteristics that are savage in sense (4) have value for the mere fact of being so?

Naturalists have often praised the transformative power of first-hand experience of wilderness. For example, John Muir (1961) defends its influence on the scientific mind.

The influence of pure nature seems to be still so little known that it is generally supposed that a complete pleasure of this kind, penetrating to one's own flesh and bones, renders scholars incapable of scientific pursuits for which a keen eye is required, cold judgment and observation. However, the effect is just the opposite. Instead of producing a dissolute state, the mind is fertilized, stimulated, and developed as plants are by sunlight. (p.104)

And Wendell Berry (1987) invokes the humility that this can produce.

The reason for preserving the wild character is that we need it... We need to go from time to time to places where our works are not allowed, where our hopes and plans have no influence. We need to be in the presence of the unconditional and mysterious formality of Creation. (p.146)

Still, there are reasons to be skeptical about the value of wildness in humans. Few will deny that our genetic predispositions often need to be curtailed and that non-humanizing environments can bring out the worst in us. This suggests that some wild features have little or no value. On the other hand, the wild character can be a bearer of value without, therefore, having to maintain that all those actions that are to a great extent wild have to be good. The value of the wild character must be qualified in at least three ways.

First, other values often override the value of wilderness, both in humans and in ecosystems. To live in human communities we must often develop artificial conventions that limit and structure patterns of behavior. It is clear that the development of technologies that separate us from natural environments promotes many goods. Any wildness-related value will be just one of many values that affect the rating of a behavior or characteristic, and often those other values will override the wildness value.

Second, the value of wilderness is contextual to humans and ecosystems. It could be argued that wild ecosystems would not be valuable in contexts where such ecosystems predominate on land and pose a threat to human well-being. Similarly, in a context such as the current one, in which a large part of human activity is caused by humanized environments, the wild character in human beings becomes a significant bearer of value. Our wild character should be in balance with our civilized aspects. When either of these two aspects becomes too dominant, the other becomes especially valuable. I suggest that the appeal of a wide range of popular activities may be partly explained by the value of wilderness. The fascination with outdoor recreational activities -such as camping, boating, mountain biking and gardening-; the appeal of certain Eastern and Native American religions, with their emphasis on simplicity, natural cycles, and interconnectedness; and the desire to reconnect with our instinctive impulses, as in the

appropriations of the imaginary of the “wild man” by the movement of men[q], they all seem to have in common an appreciation for the value of the wild, in the sense identified in (4).

Third, the wild character has a value in human beings when it is accompanied by certain other properties. It is in this sense that it may be what Rolston calls a systemic value (Rolston, 1974, 71). Rolston points out that another important environmental value, biodiversity, is not valuable independently of other properties (if it were, genetic engineering could solve our biodiversity problem). It has value when accompanied by properties such as being a unified, self-organizing whole that has developed naturally. When it appears in a system characterized by such properties, biodiversity is a value carrier in the sense that changes in biodiversity produce changes in value. The wild character also seems to be a systemic value. The wild character has value when, in the activities mentioned above, it exemplifies other sets of properties associated with recreation, spirituality, self-knowledge or expression. These activities will be more or less valuable by virtue of their relative wildness.

The wildness type identified in (4) seems to satisfy the criteria of the principle and seems to be a good candidate for an extension to humans of the ecosystem wildness theory of value. As such, it shows how preservationists’ appeal to the value of unhumanized nature does not necessarily mean implausibly isolating humans from nature. Human beings have been much wilder than they are today, but they can still display a significant degree of wildness; a wild character that is even more valuable due to its rarity.

As the value of wildness in humans has increased in the context of post-industrial societies, it offers in part a reason to integrate more fully in relatively wild environments. Therefore, extending wildness to humans narrows the gap between preservationists and integrationists, because the rationale it offers for integrationist policies is also friendly to preservationist goals. Since “wilding”[r] humans on a large scale would most likely reduce the wildness of ecosystems, the wildness theory of value leaves us with unresolved value conflicts. The predictable and entirely appropriate response to such conflicts would be a compromise in which some lands would be preserved in relative isolation from humans, while other lands would be transformed by human presence into new sustainable ecosystems. The rapidly increasing human population puts pressure on both types of land and threatens wildness in all its manifestations. It only remains to hope that the wild character becomes more valuable and that its value becomes more evident as a result.

[q] “The men’s movement’s appropriation of ‘the wild man’ imagery” in the original. With “men’s movement” the author probably refers to the so-called “men’s rights movement”, a movement of reaction against the advance of feminism in modern society. *N. from t.*

[r] “Enwilding” in the original. *N. from t.*

FINAL NOTES:

1. I am grateful to Ned Hettinger, Gray Varner, John Visvader, and members of the audience at the Society for Human Ecology⁹ meeting for their comments on this text.

2. Roderick Nash (1967) and Max Oelschlaeger (1991) represent the most comprehensive histories of the preservation movement and its thinkers. Holmes Rolston (1991 and 1994) and Reed Noss (1992) contain important contemporary advocacy for wilderness preservation.

3. The discussion that appeared in *Restoration Management and Notes*, vol. 10, 11 and 12 encouraged Eric Katz (1992) to show just how tangled and unproductive disputes can become when different notions of nature come into play, each laden with different values.

4. See Elliot (1992), Katz (1992), and Rolston (1994) for defenses of the wild value.

5. Rolston (1994) Contains an excellent exposition of the different senses in which human beings are or are not part of nature and defends a non-historical description of human beings as partially “part of nature”.

6. Alice Hoffman’s popular novel *Second Nature* offers a colorful portrait of the “humanization” of a feral person and points out key dimensions of this process, while also distorting it for dramatic effect.

7. Holmes Rolston comments on a variation of this principle, but seems to associate deliberate action with purposeful action. As a result, no human action (other than movement) can be natural or wild. In light of this consequence, he concludes that this description of the natural has limited usefulness.

8. One can interpret human disturbance and control to refer to any effects of human activity or to mean only those effects that divert the ecosystem from what it would have been without such activity. Certain profound aspects of the reasons for restoring ecosystems depend on which of these two approaches is adopted when describing the wildness of ecosystems, since restoration is a human activity that returns an ecosystem to how it should have been. If this does not imply recovering the value of its wild character, then it is difficult to make a case for restoration rather than for the creation of healthy but different ecosystems. An assessment of the pros and cons of descriptions of the feral character that emphasizes different notions of human alteration and control would be beyond the scope of this article.

9. I will develop such a description of ecological restoration, basing it on the value of wilderness, in Throop (in preparation).

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[t] There are several Spanish translations of this essay published in book format, under the titles *Caminar* or *Pasear*. *N. from t.*

THE IMPORTANCE OF WILD NATURE¹ || A.Q.

1. What is wild Nature?

Wild Nature is everything that is not artificial and whose functioning is autonomous. The wild is the part of Nature that is untamed, that is not subject to control and management by human beings (or by technological systems manufactured by them). The influence of human beings in great part of the planet's ecosystems has been intense in recent centuries (or even millennia) and this is especially noticeable in the Iberian Peninsula, where the wild does not have a presence either in the environment or in the culture even remotely similar to that of other countries (especially those of Germanic and Nordic descent, where the term "wilderness" comes from, which I will talk about later).

The notion of wild Nature and its value is little known in Spain. These questions have been theoretically very little developed and have hardly had any presence and influence in the culture and the population in general, not even among those who say they love Nature and want to conserve it. Yet wild Nature is still there, everywhere, more or less dominated depending on the place and, for the moment, still latent, being able to resurface wherever it is free from the interference of human societies.

One of the consequences of the scarce presence of the wild in Spanish culture and environment, is what is known as "the Shifting Baseline Syndrome", applied at the ecological level (Palau, 2019): as ecosystems lose their wildness (the autonomy of natural processes), people tend to take as references of healthy and well-preserved ecosystems, environments that are really nothing but, at best, degraded states of what once there was. This has influenced the way many people within environmentalism tend to pose the ecological ideal in Spain (a country intensely humanized for many centuries): a rural or urban "green" world, with a "nature" that is mostly domesticated and largely dependent on human beings and their culture. If all that a person gets to know in his surroundings are streets of cities and towns, gardens, agricultural or livestock land,

¹ Translation from the Spanish of the article "The importance of wild nature", published on *Naturaleza Indomita* [<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-and-ecocentric-theory/la-importancia-de-la-naturaleza-salvaje>][<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la->][<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-importancia-de-la-naturaleza-salvaje>][[importancia-de-la-naturaleza-salvaje](https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-importancia-de-la-naturaleza-salvaje)]. Copyright © 2020 by AQ *Translator's note*.

tree plantations and secondary forests, the most normal thing is that this person ends up thinking that this is true Nature, since the environment does not have territories that serve as a reference of what is a truly natural, healthy and well preserved place. Some mental effort is necessary (apart from some level of ecological knowledge) to realize that real (i.e., wild) Nature is something else: what was there before all that domestication and degradation. This “syndrome” favors taking as a reference of what are healthy and well-preserved ecosystems, environments increasingly degraded.²

2. What is a wilderness area?

This English term, which lacks a similar term in Spanish, refers to the little or non-humanized areas where Nature follows its own dynamics. Depending on the context it can be translated specifically as “wild/wild lands”, “wild/wild ecosystems”, “wild/wild areas” or, more generally, as “wild Nature”. There are different definitions depending on who gives them and where they appear (European Commission, 2013. Pages 13-14), but at least they all agree on this: it is about areas where the footprint of the human being is non-existent or difficult to be perceived, without roads, gravel-roads or tracks, no permanent human settlements or other artificial infrastructures, or productive-economic uses (agriculture, livestock, forestry, mining, etc.). In other words, they are territories where natural dynamics are paramount. This may seem like something very abstract, but I’m sure any Nature lover has at least an intuitive notion of what a wild environment is like.

The first law for the protection of wild ecosystems was the Wilderness Act of 1964, in USA, in which you can read:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.[1589]

After this, the IUCN (International Union for Conservation of Nature) created some categories to try to differentiate the several types of protected spaces. One of those categories mentioned by the IUCN is that of “Wilderness Area”, category Ib (Dudley, 2008. pp. 17-19), which agrees mostly with the American concept of “wilderness”. In addition, this organization mentions the possibility that these types of protected areas are in turn inserted into other broader protected areas under another category and denomination, such as National or Natural Parks (Dudley, 2008. p. 20).

More recently, the European Commission defined a wilderness area like this:

*A **wilderness** is an area governed by natural processes. It is composed of native habitats and species, and large enough for the effective ecological functioning of natural processes. It is unmodified or only slightly modified and without intrusive or extractive human activity, settlements, infrastructure or visual disturbance.*

² Page 114.

The definition includes four qualities of wilderness: a) naturalness, b) undisturbedness, c) undevelopedness and d) scale; an overarching and changing variable which by definition is central for the wilderness concept. (European Commission, 2013)

Furthermore, the fact that an ecosystem has suffered various artificial disturbances during a time, even over centuries, does not mean that the wild has completely died in it and, therefore, it does not mean that he cannot fully or partially regain its wildness.

The experienced American conservationist Dave Foreman put it like this:

[...] Ecosystems often can recover from human-caused impacts over periods of time, depending on the level of impact. This resilience should never be used as justification for further intrusions into wilderness, but it does provide a valid rationale for the concept of wilderness recovery and rewilding. (Foreman, 2014)

From all this it could be deduced that, for an area to be considered wilderness, first it must be legally declared so. However, many wilderness areas are not protected by law, and wildness (and the capacity for regeneration thereof) exists in different degree anywhere on the planet (even in environments as artificial as a city). So, protected wild areas only represent a portion of wild Nature.

3. Why is wild Nature important?

Some people may wonder why wild Nature is important. Some reasons are:³

- a) Wild nature and wild character have intrinsic value.
- b) It is an essential source of ecosystem services (not only beneficial or necessary for human beings, but for living beings in general).
- c) It is a source of non-artificial biodiversity. Although the diversity of species and wildness do not always have a directly proportional relationship, the number of species dependent on wild ecosystems is innumerable.
- d) Wild Nature is home to most non-domestic living things. Many species cannot (or barely) live in artificial environments with constant human presence.
- e) Wild Nature is also the necessary medium for evolution to follow its course autonomously, and wild ecosystems are the genetic reservoir of the wild life forms.
- f) If the wild disappears, there will no longer be references that indicate that there can be other forms of life, environments, influences, etc. different from those offered by civilization and humanistic thought (see what has been said about shifting ecological baselines).
- g) It is necessary to recognize, despite the increasing presence and domination of the human societies on the environment, that wild Nature is still there and it does not need us. Similarly, having influence is not the same as being in command.
- h) It is necessary to face conservation from an ecocentric point of view (wild Nature comes first) and not anthropocentric (humans, their culture and their things come first)

³ Apart from what is exposed here, to go deeper into the importance of preserving wild areas, can be read: Foreman, 1994 and Buckley, 2010.

or even they are the only thing). Without this perspective, Nature conservation will be weighed down from the starts.

i) The complexity of wild Nature has hitherto exceeded, and will always exceed human prediction models. To pretend that humans are capable of managing ecosystems (for their own good) more successfully than autonomous natural processes, is a gesture of arrogance very typical of our species, which does not correspond to reality.

j) It is also our evolutionary reference environment. It's the place where our species evolved and to which our physical and psychological capacities are adapted. Proof of this is that, for many (if not for most of the) people, Nature inspires a reverence and passion that no artificial environment generates.

k) There are also reasons of a scientific nature. Conservation biologists have shown that large predators are fundamental pieces for the conservation of ecosystems (in terms of their structure, functioning, resilience and diversity).⁴⁵ These predators need large, interconnected range areas, but also core areas where they can develop certain activities that are necessary for their survival with little or no human interference (Soule and Noss, 1998).

l) Another scientific reason is that wilderness areas serve as a reference to know what an area was like before it suffered artificial disturbances, and thus they make possible to correctly assess the state of conservation of an ecosystem as well as the effectiveness of the restoration work (see what has been said above about shifting baselines).

⁴ An example of this can be seen in this article on the effects of the reintroduction of the Iberian lynx in some ecosystems: Jiménez *et al.*, 2019.

⁵ The current situation of large predators in the Iberian Peninsula apparently contradicts the claim that large predators need places free from human interference to carry out some of their activities. Sometimes species adapt to living in unnatural conditions, but this always comes at a price, and it is only true to a certain extent. In the case of Iberian bears, they live in the most remote (less humanized) places that Spanish geography allows them to (that's why they are in the Cantabrian Mountain Range and not in the Castilian Plateau, for example). If they can choose, they prefer to stay away from humans. This is a first proof that the affirmation of Soule and Noss is not misguided. Also, there are differences in life expectancy and needs of range areas with respect to other predators of the same species that live in other less humanized places. Spanish bears need to travel greater distances to feed themselves than bears in other less humanized parts of Europe. And Iberian wolves have a low life expectancy in relation to other populations of wolves from less humanized areas (Barrientos's study that I put as a reference shows that, at least in some areas of Spain, wolves die mainly from anthropogenic causes). Therefore, the Iberian large predators pay a higher price the more humanized is the environment in which they have to manage to live. And when that transformation of the environment exceeds certain limits, these predators have serious problems thrive.

4. How are wilderness areas different from Spanish Protected Natural Spaces (PNSs)⁶?

It is also likely that many people do not understand the difference between a wilderness area and the current protected natural spaces (national parks, natural parks, nature reserves, etc.) in our country. I will try to summarize here the most important differences that I see between them:

a) Spanish PNSs are created, in principle, to combine conservation of certain characteristics of the natural environment with human activities and culture. However, since such an arrangement is actually impossible (preserving and developing are antonyms), in practice the PNSs are usually managed to primarily promote the socio-economic development of the “protected” area.⁷ In this way, in most cases, the conservation of Nature remains in the background (or compromise solutions are sought in which, in the long run, wild Nature loses out).⁸ Socio-economic development can be compatible with a Nature that is domesticated and controlled by humans, but not with the wildness of ecosystems. In order one thing (human societies) to grow and prosper the other (Wild Nature) must be degraded and diminished. Most of those who are dedicated to the conservation of Nature (at least here in Spain), do not seem to realize that this physical fact (which is an effect of the laws of thermodynamics) and continue being committed to making compatible socio-economic development and the conservation of Nature. At some point it will be necessary to accept that “we can’t eat the cake and still have it.”

b) Due to the absence or almost absence of human infrastructures inside, wilderness offers a place of solitude in which one can wander through his own means (on foot). For some humans, the experience of visiting a National Park, with hordes of tourists and artificial infrastructures that create an environment of domestication and control, is not the same as entering a wild territory where one can be alone and calm, enjoy direct contact with Nature, disconnect from the influences of the social environment, or test one’s own abilities outside the comforts of modern society and thus experience true freedom. That is, wild environments enable a relationship between the human being and Nature that is different from the visit to a garden or a “natural” area designed and organized by humans.

⁶ “Protected Natural Areas (ENPs)” in the original. *Translator’s note.*

⁷ In the informative brochure *A singular territory. Red de Espacios Naturales de Castilla y León* (Reyero, 2007), edited by the regional government of Castilla y León, it can be read: “What is a Protected Natural Space? It is a rural area with special natural values that must be preserved *through sustainable development models*. [...] The protection of these natural spaces aims to achieve also the improvement of the quality of life of the populations that live in them, promoting actions to revalue natural, historical and cultural resources as the basis of a model of **sustainable socio-economic development**. *This is the main objective of the Natural Parks Program of Castilla y León ...*” (italics mine).

⁸ Two recent very illustrative examples of how the conservation of Nature in Spain remains in the background even within the PNSs:

c) The productive-economic activities allowed in the PNSs, from the more traditional activities of the primary sector, such as agriculture, livestock or logging, to the tertiary sector activities that have emerged with force in recent decades, such as sport competitions or the so-called “ecotourism”, have an impact on ecosystems that is usually underplayed by Spanish conservationists. I will briefly mention some of the most obvious effects of two of the most productive activities extended inside the PNSs. These activities are usually considered in Spain (even by a great number of environmentalists) as innocuous or even beneficial to the health of ecosystems: extensive livestock farming and logging (sustainable or not).⁹

i) With respect to extensive livestock farming:

- Overgrazing.¹⁰

- Competition and displacement on wild herbivores. (Purroy and Varela, 2016. Page 118)

- Creation and maintenance of gravel roads for livestock and forestry use. (Grande del Brío, 1982)

- Creation and maintenance of fences and barbed wires that inflict casualties among wild fauna. (C.R.F.S. Las Dunas, 2017. Page 6)

- Dogs on the loose in the bush.¹¹

- Pressure towards the administration so that it authorizes the control of predators.¹²

- Poaching of predators. (Álvarez, 2014; Barrientos, 2014)

- Degradation of riparian vegetation with the negative effects that this supposes for fish fauna and hydrological dynamics. (VV.AA., 2016; Velasco *et al.*, 2019)

- Pollution and risk of eutrophication of lakes and ponds. (Granados *et al.*, 2006; Felip *et al.*, 2014)

ii) With regard to forest exploitation, it eliminates or reduces three basic aspects of a mature and wild forest, so that these end up having hardly any presence in a managed forest where silvicultural treatments are carried out:

- Old trees standing and in abundance (healthy, dead or decrepit).

- Abundant decaying dead wood on the ground (including large logs).

⁹ Two examples: Herrera and Majadas, 2019 and Méndez, 2014. In the first article, the extensive livestock farming is presented as an activity that takes place in places where “wild life flourishes”, with “potential for integration in the dynamics of ecosystems” and “enhances the conservation of many of the most valuable habitats”. The second article talks about a “new forestry” which, in theory, will make the extraction of wood from forests compatible with conservation of saproxylic organisms, and which the author proposes as an alternative to conventional logging.

¹⁰ In the following references, overgrazing is cited as an ecological problem: Barquín *et al.*, 2018. Page 101; several authors, 2009. While this other text deals exclusively with overgrazing: Martínez-Murillo and others, 2011.

¹¹ Much has been said about the ecological problems that feral dogs cause, but very little about those created by the dogs that guard the livestock. These remain loose in the bush for 24 hours and have some effects on the environment similar to that of feral dogs.

¹² For example, see the article “105 wolves have been killed from 2015 to October 31 in Cantabria with the authorization of the Government”, *El Diario de Cantabria*, November 7, 2018:

- Abundance of saproxylic organisms (considered “pests” in forestry).

If all the definitions of wilderness areas around the world agree on something (European Commission, 2015), is that productive-economic activities, such as these, should not be present in these places.

5. So what can be done to protect wild Nature?

So far in this text I have dealt with the issue of the protection of wild Nature as if the only way to achieve such a thing was the legal protection of wild spaces or “wilderness”. However, the following questions may be asked:

5.1. Is the legal protection of wild areas effective in the long term for protecting wild Nature?

As I have tried to show in the text (for example in note 8), in some countries, like Spain, the wildness of ecosystems is not even taken into account in terms of conservation. This is a first impediment for the strategy of defending wild Nature through legally protecting the largest possible territory being effective in the long term: Wild Nature has to be taken into account by governments and administrations countries, and this is not always the case.

Furthermore, this strategy is based on the assumption that a balance can be achieved between wild Nature and current modern civilized human societies (which we will call from here on in this text: techno-industrial society -TIS-). Actually, with a constantly increasing human world population and a technological level also constantly increasing, the possibilities of keeping areas out of development and degradation are ever fewer. The matter, energy and space that the STI needs to grow (or simply to stay steady) along with the waste generated by its everyday activity make the level of transformation of all planetary ecosystems be also in constant increase and fewer and fewer areas remain free from TIS interference. With this trend, the pressure on wilderness, protected or not, will also be increasingly higher over time.

On the other hand, there are effects of the technological progress (such as air pollution or change climate) that escape the legal barriers that may be dictated for protecting certain places and intrusions into protected natural spaces are common (both due to poaching and due to permissiveness or negligence by the managers themselves). And all this assuming that the fact that an area is legally protected today means that it will be protected legally forever, which to me seems too much to assume (in addition to the fact that humans rarely obey laws wholly, laws can and do change over time). The ecocentric conservationists themselves (those who take wildness as reference for con-

servation), recognize that even the protected wilderness areas are gradually degrading (albeit at a slower rate than the rest of the territory).¹³

Therefore, although the legal protection of wilderness areas is a laudable end (it is better than nothing, since it delays the degradation of the protected areas), everything indicates that it will not serve in the long run to protect the wilderness from the advancement of the TIS.

5.2. Are there other alternatives to protect the wild nature?

The three alternatives (or complements) to legal protection of wild ecosystems that I have regularly seen that conservationists and others who recognize the important value of wild Nature mention, are the following. The first two have to do with the reform of the TIS and the third with the collapse thereof:

5.2.1. Regulation of world population size and per capita consumption

A common response to objections to the legal protection of wild ecosystems is that, then (or in addition to it), the TIS should be reformed in such a way that the world human population can be stabilized or reduced and the growth of the level of per capita consumption can be reversed, either through political programs or through energy and technological improvement, or through both. Regarding this, it is necessary to take into account that:

(1) Technological development in itself (even in the absence of population growth and of increase in the level of per capita consumption) also amplifies the impact that human societies have on wild Nature. This is so due, among others things, to the Jevons paradox (Foreman & Carroll, 2014). This comes to say that the the energy saved in one part of a system does not help the whole system to consume less energy, but it allows this energy to be used in other parts of the same system instead, eventually increasing total consumption. In the case at hand, this means that, increasing energy efficiency generated by technological development, does not and will not entail a decrease in the total impact generated by the TIS on wild Nature, but just the opposite. In this sense, it is curious that many of those who alert, rightly, to the ecological problems that the demographic growth and the increase in per capita consumption imply, nevertheless commit the great clumsiness of seeing technological development as a reducing factor

¹³ For example, in Buckley (2010), p. 3 and Wolke (2014), p. 4-5.

of the effects of population growth and consumption rather than seeing it as what is actually is, a multiplying (besides a causing) factor of the previous two.¹⁴

(2) The simple maintenance of the TIS (just without technological development, growth population or increase in the level of per capita consumption) requires a constant search for resources in areas not yet transformed. Many raw materials and basic energy sources (non- renewable, non-recyclable and hardly substitutable on a large-scale) for the operation of the TIS (such as fossil fuels or certain minerals)¹⁵ cannot be extracted indefinitely in ecosystems already degraded, they must be continually sought in ecosystems not yet exploited instead. And sooner or later the opportunity or the need for extracting them will present itself even in protected wild areas.

5.2.2. Education

In addition to the above, many texts on the conservation of wild Nature tend to emphasize the importance of education, awareness-raising and propaganda in promoting some values among the population. They usually go even further, up to the point of implying that the ultimate cause of the degradation of wild Nature is that humans don't have the right mindset. That is, if humans possessed an "environmentalist" and respectful mentality, the degradation of wild Nature would cease.

However, it is necessary to take into account that:

(1) The ultimate and main causes of ecological problems are material (social, demographic and technological development) not ideological and, therefore, the solutions should act on these material causes, not on ideological causes that, at best, are not the main or ultimate causes, but only secondary.

(2) Convincing people nicely (that is, rationally, through arguments and facts) to put Nature before everything else is doomed to failure in the vast majority of cases. Most humans naturally tend to care primarily or exclusively about ourselves or our loved ones, as well as about what affects us directly. In addition, we tend to think mainly or exclusively in the immediate and short term, and based on emotions and not on logic and facts.

(3) Therefore, to change the mindset, values and behaviors of the people would require means of propaganda, indoctrination and coercion on a large scale that would

¹⁴ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁵ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*["], we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

involve large organizations, a large and complex social system, and an advanced technology, as well as maintaining such media over time so that the population do not stop thinking and behaving as desired. That is, it would be necessary to maintain the material conditions that cause the current ecological degradation, which would be absurd.

(4) Even if the population could be rationally persuaded to assume willingly the ecocentric values, this would not imply necessarily that society's impact on wild Nature was reduced. Humans have a high capacity for self-deception and excuses, to develop easy but ineffective symbolic behaviors that calm our conscience and cheat on it, etc. (There are many examples of this in religions). So an "ecocentric" industrial society would not reduce its ecological impact to a great extent. Most likely (from what was said in 2) most people would not go beyond developing some type of religion or symbolic behavior that would allow them, on the one hand, to worship Nature and feel good about themselves (appease their consciences) believing that they thus comply with ecocentric values and, at the same time, on the other hand, to continue living a techno-industrial way of life (and therefore, in practice, acting contrary to these values and with a very large real impact on Nature).

(5) Trying to change people's minds is actually a form of social engineering, that is, to try to control the development of a society in order to direct it towards the achievement of certain goals. And, like any other form of social engineering, it doesn't work in the long term and it even leads to new problems or worsens the old ones, because the development of a society is unpredictable and therefore uncontrollable (Freedom Club, 1995, paragraphs 99110).

5.2.3. The impending collapse of modern industrial society

At this point, the next question to ask oneself is: if it is not possible to reform the TIS to protect wild Nature in the long term, what alternatives do we have?

And it is clear that, However much difficult it may seem to many people to accept, only two options remain:

- That the TIS goes ahead. In this case, it will unavoidable that the TIS ends up transforming, dominating and degrading in the long term and at the planetary level every redoubt of wild Nature, including protected wilderness areas. Even if the TIS disappeared later, by then the transformation of ecosystems, species and other natural processes could have reached a level that would be irreversible (at least for the next several millions of years).

- That in a not very long period of time (let's say in a few decades), the TIS disappears. In this case, wild Nature will have been largely saved, since it would be difficult that the conditions that allowed the industrial revolution to occur happened

again in at least hundreds of thousands of years,¹⁶ and civilized pre-industrial societies (which are the largest and most complex type of human societies that could arise if the TIS disappeared completely) do not represent a comparable threat to Nature to that represented by the TIS (although they also degrade Nature to a great extent).

Having advanced so far, it is worth asking: and how would it be possible that the TIS disappeared (if it could be possible at all)? Different scenarios can arise: a spontaneous collapse, a human-induced collapse, a planned gradual dismantling, or a mix of all or some of these possibilities. But there is no easy solution: all the options would mean a drastic change in our ways of life and very high levels of human death and suffering.

So, what is really important? If we consider wild Nature as the most important thing to preserve (above human cultures), the only long-term solution is the end of its greatest threat: industrial civilization. Therefore, that to what conservationists and ecocentric wild Nature lovers should direct our efforts is to publicly defend and favor that humanity changed completely its course and left the path of development. That is, to publicly defend and favor, to the extent of our possibilities, the collapse and the end of the industrial technological system, since it is the only option that can preserve wild Nature in the long term.

Some of the people who recognize the immense value of wild Nature cling to the belief that (1) the TIS will shortly collapse on its own, so they do not find it necessary to work to cause or accelerate such collapse in order to preserve wild Nature. Furthermore, this belief is usually linked to the idea that, due to some characteristics of human psychology, (2) you cannot form a movement that makes the course of society change. (Foreman and Skrbina, 2014, pp. 6-7)

(1) Regarding the first idea, the TIS has shown, especially in the last decades, adaptation and resilience to the problems that arise in relation to its functioning. There is no guarantee that future TIS problems (being them problems regarding energy supply, environmental problems or problems related to the control of the human behavior) will cause the collapse of the TIS on their own. Those who hold such a thing seem as if they had a crystal ball to divine the future, since their forecasts go far beyond what can be inferred logically from the empirical facts. For example, it is quite likely that some of the most important raw materials and energy sources for the operation of the TIS to date they will not be sufficiently abundant in the immediate future to continue the increase in the human standard of living that we have seen in recent centuries. So far, this is only what one can say, based on the available data and physical laws, with a high probability of being a correct forecast. This and the affirmation that the TIS will collapse and disappear are worlds apart, and the mind should not leap lightly from the former to the latter. Other possible scenarios should be considered. Among them: the probability that the TIS will achieve stabilization at a lower energy level long enough

¹⁶ I mean that for a long time some of the conditions that led to the industrial revolution, such as the availability of sources of energy with a very high energy performance or the abundance of easily extractable minerals, would not exist anymore .

to find other sources of energy that allow it to continue growing, the probability that the technological system will recover when it is close to collapse if there is no movement and/or ideology that promote destroying what will be left of the system before it can be reconstructed or the probability that, even if the TIS eventually collapses, then it might be too late to save many of the wild species and ecosystems that exist on this planet (see point 6) or even the human species as 19 we know it currently.

(2) With regard to the second idea, it is necessary to take into account that, often, the radical changes in human societies are promoted and sought by active minorities. The fact that, broadly speaking, human psychology does not favor that the majority of people are going to support and work properly for such a goal, is not an impediment to the formation of a movement for which only the work of a minority of the population is necessary, as long as this minority is resolute and effective, of course. Moreover, the very fact that the few people who could work for the creation of said movement refuse to do so with the excuse that it is impossible to create this movement, is one of the factors that have an influence on that, indeed, such a movement does not arise.

6. Summary and conclusions:

Wild Nature, the autonomy of natural processes, is currently threatened by the development of the most complex of social system generated in human evolution: techno-industrial society.

There are many reasons why wild Nature is invaluable, and this has led many of those who recognize them to try to protect the wild in various ways. The legal protection of wilderness (a widespread practice in many countries but not in the Iberian Peninsula), the regulation of human population size and per capita consumption, or education, are three of the most common ways in which ecocentric conservationists try to protect the wild. The rational analysis of these strategies

⁻¹⁷ Although serious doubts about whether saving the human species is a desirable goal (in view of the ecological degradation that some of the human social systems have generated) can be raised, there is no doubt that saving the autonomy of the wild is.

¹⁷ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out* , page 237).

reveal that they will not be adequate or sufficient to protect wild Nature in the long run (something recognized to some extent even by some ecocentric conservationists).

Therefore, if we consider wild Nature as the most important thing to preserve (above human cultures), the only long-term solution is the end of its greatest threat: industrial civilization (the social system whose technology is based on motorization). Due to this, that to which we the conservationists and ecocentric wild Nature lovers should direct our efforts is to publicly defend and favor that humanity completely changes its course and that the path of development is abandoned. That is, to publicly defend and favor, to the extent of our possibilities, the collapse and the end of the industrial technological system, since it is the the only option that can preserve wild Nature in the long term.

In this regard, it is not admissible to cling to the illusion that the industrial technological system (and, therefore, the social system that it sustains) is going to collapse on its own shortly. There is no guarantee that it will happen this way and, if it did so in the future, it might be too late for a good part of the wild species, ecosystems and natural processes. Wild Nature needs to get rid of its greatest threat: modern technology, now that it still has time.

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Presentation of "A definition of the wild character"

The following text is nothing more than one more failed attempt to define the wild character by an individual for whom it is obvious that said task is too big for him. And the result, consequently, is far from being as clear and precise as would be desired. However, the interest of the text lies not so much in the fact that the author makes a more or less botched attempt to define the savage character, but rather in some of the things that he mentions in said attempt, either clearly and explicitly or obliquely. Specifically, it is worth noting the idea that science (especially, it is supposed, ecology) should take into account the wild character as a parameter when evaluating the quality of natural systems and their component parts and the idea that this character consists in the autonomy of Nature. These two and some other ideas make the text useful to think about what the wild character consists of and what it does not.

Unfortunately, the author is not very skilled at using language to express his ideas clearly and unequivocally, and the result, as has been said, is far from what the title promises: a minimally useful and precise definition, something that works for us. to clarify quickly and minimally exactly what is and what is not the wild character. Thus, the author uses certain terms in a confusing way (honesty, alienation, process, approach to life, etc.) to try to define the wild character or its absence, so that it is not quite clear what they refer to and What do they really have to do with the autonomy of natural systems?

Another of the defects of the text is that the author, despite trying to give a more or less original solution to the problem of the so-called human/Nature dualism (that is, is the human part of Nature or not?) differentiating between character wild and natural character, he continues to fall into the error of considering that the Nature to which he and those who value the wild refer, is the same as the "Nature" to which some philosophers and academics refer in their "work" moments. According to them, Nature is all that exists (Furthermore, *Wikipedia* says so! Word of God! Amen¹). However, neither the author, nor any of those who value wildness, nor even the aforementioned

¹ As much as the *Wikipedia* sometimes has valid articles to be used as a reference and source of data on certain topics, written by sensible, capable and knowledgeable people of the subjects in question, many other times (and this is especially true in languages other than English) it is still what it is: a site where anyone can enter and write an article on a topic not previously covered, whether they know what they are talking about or not, know write and use language or not and be gifted or retarded. Being democratic and open does not make an encyclopedia more reliable.

intellectuals outside of their offices, books and classes, really tend to think of everything that exists when they think of "Nature", but more good only in what is not artificial. If, as it seems, the author considers wildness to be closely related to honesty, he might start by acknowledging this and being logically consistent with it.

Apart from these two fundamental flaws, the article has some other more specific errors that we will briefly comment on:

- Too many references to places and common referents of radical or deep ecology (of which the so-called ecopsychology is only a branch) that are more than doubtful.

For example, the hackneyed quote from Standing Bear that basically what it comes to mean is the rejection of the wild as something bad and the applause of meekness as something good. (Not because it was said by an Indian it has to be a correct and wise phrase!).

- Consider that confusion is the cause of psychological distress, when in fact it is rather one of its consequences or symptoms. Specifically, it is an effect of insecurity and feelings of inferiority and impotence derived from the impossibility of adequately experiencing the need to carry out the so-called process of power.²

- Consider that the dingo is no longer an exotic species in Australia and that it is integrated into the Australian wild ecosystem. There would be much to discuss about it, but to solve the problem of exotic species by saying that after a while they end up adapting to their new environment and become part of it is to overlook the fact that during this period of adaptation they can cause enormous damage to the ecosystems and native species, so that in many cases it could even be doubted whether the ecosystem to which they end up adapting is already the same one they first arrived at or just a caricature (that is, some degraded remnants) of it. In the case of the dingo, even if we assume that today it is already adapted to Australian ecosystems (something perhaps even doubtful), in the thousands of years that have passed since its arrival in Australia and the present this artificially introduced species has been responsible of the extinction or reduction of a few species of other animals,³ with the consequent ecological impact that this entails. It's not exactly a happy ending where everything works out. Extinct species do not return.

- And something similar can be said of the author's statement that the moral assessment of the ecological effects of self-introduced organisms is comparable to that of the ecological effects of organisms introduced by humans. This is a shocking statement for someone who wants to enlighten us about the wild character of Nature and the beings that compose it. Not seeing the difference between introducing a species artificially, and what that entails, and that species reaching a new territory by its own means

² See in this regard: [https://www.naturalezaindomita.com/publicaciones][*Industrial society and its future*,] [http://isumatag.blogspot.com/][Isumatag,] 2011. Paragraphs 33-86.

³ See for example: Mike Letnic, Melanie Fillios and Matthew Crowther, "The arrival and impacts of the dingo", in Alistair Glen, Christopher Dickman (Eds.), *Carnivores of Australia: Past, Present and Future*, CSIRO Publishing, 2014, pp. 53-67. Or also, by the same authors (2012), "The impact of the dingo on the thylacine in Holocene Australia", *World Archeology*, 44:1, pp. 118134.

does not seem to be understanding much of what the matter of wildness is about. The only case in which both artificial introduction and self-introduction and their effects are morally comparable would be that of our own species, *Homo sapiens*.

A definition of the wild character

Lawrence J Cookson⁴

Wilderness,⁵ wilderness⁶, and wildness⁷ are important concepts for ecopsychology, insofar as they recognize nature on its own terms and allow it becomes a source of inspiration and comfort that often finds its place in the human psyche (Greenway, 1995; Hartig and Marcus, 2006; Montes, 1996; Ulrich, 1984; Walsh and Russell, 2010). Current definitions of *wildness* and *wilderness* focus on naturalness⁸ coupled with independence from human beings. A wilderness is an area free from human-enforced barriers (Public Law 88-577, 1964) and *wild* is used to refer to organisms in their natural state, not domesticated or cultivated. However, independence from human beings has been called into question. Indigenous peoples have long lived in 'wilderness' and most of Europe has been inhabited or modified by humans at some point (O'Rourke, 2000). Likewise, human beings are animals and therefore have always been "natural," suggesting that there is no special distinction between them and wild things. Wilderness has been considered a postmodern construction (Callicott, 1998, 2000; Vogel, 2003). It is clear that certain aspects of wilderness and wildness have been going unnoticed (Willers, 2001), which may be due to a poor understanding of the processes that created them, the quality of being wild.⁹

The term *wild* [wild] has a history that goes back long before post-modern construction. Spelled as "wilde" in Old English, it has Proto-Germanic origins dating from approximately 1500 BC to 1000 BC, which in turn had derived from the Indo-European (ca. 4000 BC-6000 BC) term *ghwelt* (the Welsh word for *wild* is *gwyllt*) (Ayto, 2005). Similarly, the term *wilderness* [wild land] is believed to have derived from Old Gothic

⁴ Translation by Último Reducto of "A Definition for Wildness", *Ecopsychology*, vol. 3, no. 3, September 2011. © Mary Ann Liebert, Inc. *N. of. t.*

⁵ "Wilderness" in the original. English term that refers to little or no humanized areas. In this text it will be translated as "wildlands", "wilderness ecosystems" or "wilderness areas" unless explicitly stated otherwise. *N. of. t.*

⁶ "Wild" in the original. English term that, in addition to being used as an adjective to refer to "wild", is used as a noun ("the wild") to refer to what is non-artificial and autonomous, that is, to wild Nature. In this text, unless explicitly stated otherwise, it will be translated as "savage" when used as an adjective and "lo salvaje" when used as a noun. *N. of. t.*

⁷ "Wildness" in the original. English term that refers to the quality of being wild of an entity or natural process. In this text it will be translated as "wildness" unless explicitly stated otherwise. *N. of. t.*

⁸ "Naturalness" in the original. It refers to the naturalness or quality of being natural (= not artificial) of an entity or process. In this text it will be translated as "natural character". *N. of. t.*

⁹ "Wildness" in the original. *N. of. t.*

languages meaning “will-of-the-land” (Vest , 1985). ”Thanks to Vest, we are able to understand that this word, *wilderness*, is not a term coined by modern civilization, it is a word from the Bronze and Iron Ages” (Foreman, 2000) .

The meaning behind *wildness* is less clear and often elicits poetic license as it describes an approach to life rather than an object that is easy to study. It has been called a frontier concept (Drenthen, 2005). Ambiguity about the concept of feralness has made it difficult to study in biological science. Very little has been written in a mechanistic sense about savageness and how it operates, even when on the surface it appears to be the most distinctive feature of nature that is not under human control. Incomplete, romantic and spiritual definitions have not helped to attract the attention of scientists, who prefer reductionist investigations. A definition is needed that is able to offer a more testable basis from which to analyze the results and show that wild character is not simply a synonym of *natural character*.

Existing Impressions

For some, wildness is an uncontrolled state, in which base desires and instincts take over, resulting in social upheaval and violence. According to this, wildness leads to animal behavior and should be avoided. Examples abound, both fictional and non-fictional, in which living in the wild¹⁰ without restraint causes social collapse (Ballard, 1999; Brand and Smith, 2000; Golding, 1954; Groes-Green, 2010). Fear of wildness sometimes led white settlers to commit extreme cruelties against Indians, whom they considered to be the epitome of the “wild man” (Taussig, 1987).

For others, wilderness and wildness can be like a refreshing tonic and source of new ideas (Adams, 2002; Ausema, 2008; Lister-Kaye, 2011; Shaw, 2011; Thoreau, 1906). They can be subjects that inspire art, as in the paintings of John Constable and JMW Turner, the photography of Ansel Adams and Eliot Porter, and the poetry of Gary Snyder and Robinson Jeffers. Wildness has been described as a quality produced in nature (Thoreau, 1906), as what emerges from a natural place or forest (Micoud, 1993; O’Rourke, 2000), as the spirit of the wild (Waterman and Waterman, 1993) and as a level of achievement in nature (Cookson, 2004). The quality of being wild¹¹ is a process rather than a place (Higgs, 2006) and has to do with behavior (Ridder, 2007). Another important aspect of the wild¹² is that “Nature retains a degree of autonomy, or wildness, apart from human works” (Evanoff, 2005).

These characteristics suggest that wildness is an approach to life that spans two levels of organization, an inner arena in which basic nature operates and an outer arena that is self-organizing, a quality that many find inspiring. To be wild, there should be a certain degree of honesty and directness, of spontaneity and instinctiveness. Organisms cannot properly participate in wildness until they reach a level of inner quality or clarity, where they are in direct and honest contact with their basic information

¹⁰ “Living in wildness” in the original. *N. of. t.*

¹¹ “Wildness” in the original. *N. of. t.*

¹² *idem.* *N. of. t.*

and motivations, otherwise there would be instability in the system to which they contribute. These features suggest a possible definition of *wildness*: *wildness* is a quality of the interactive processes between organisms and nature in which the events of their basic natures occur. , allowing the construction of durable systems. Therefore, wildness can be considered a process, method, system or approach to life, but carries the caveat that such processes should be of a certain quality or level . The quality of being wild¹³ can therefore produce its system, structure, relationships, wilderness, ecosystems or even “its wildness” (in an organizational rather than a methodological sense) of quality. Being a self-organizing system, the wild character uses itself as a process and as a developing structure in which its processes become fluid.

Basic nature quality

The inner effect of the wild character is that it appeals to basic natures, instincts and desires. Using the wild character or becoming wild allows one to do, or attempt to do, whatever they want. Here, the wild character offers an interesting contrast between animals and humans. Wildness in humans is often seen as detrimental, while wildness in animals is essential to the health of their ecosystems.

The importance of maintaining wildness in animals is recognized in the management of national parks, where feeding wild animals is prohibited, as they may lose the skills they need to fend for themselves (Mallick and Driessen, 2003). ; Orams, 2002). Animals released into the wild¹⁴ often must be dishabituated from humans to develop the mindset and skills necessary to survive, with famous examples such as the lioness Elsa (Adamson, 1960) and those of rescued orangutans (Smits *et al.*, 1995). These are particularly good examples of how released animals must learn a new set of instincts and quality processes to survive in the wild.¹⁵

While wildness is important for the survival of animals in the wild and for the health of their ecosystems, in humans wildness would likely be destructive and irresponsible to our social system (Ostermann, 2005). Going wild is giving more power to basic impulsive actions, whether they are harmful or not. Criminals are often presented as if, during their violent acts, they behaved in the same way as wild animals. Human beings seem to have a subconscious fear and resistance to the wild character, as it can venture into areas that are taboo.

This contrast may suggest why wildness works in nature but not in humans. The wild character draws on the basic nature but can only function properly when the basic nature is frank and honest. Only then can the result of the wild character be supported by the system that hosts said organism and be beneficial to said system. Thoreau (1906)

¹³ “Wildness” in the original. *N. of. t.*

¹⁴ “In the wild” in the original. *N. from t.*

¹⁵ *Idem. N. of. t.*

wrote the famous phrase “In the wild¹⁶ lies the preservation of the world”. Presumably this means that if we could process our thoughts and ideas through wildness, we would be better creatures. According to Botkin (2000), Thoreau was focusing on “the importance of wildness to people, not wildness itself.” He saw “wildness as a spiritual state existing between a person and nature.” Another Thoreau quote, “Wildness is most alive,” suggests that quality is enhanced by wildness .

The corollary of this argument is that the inability of human beings to use their wildness constructively implies a critique of the quality of our basic nature. “The concept of savageness often expresses rather an impulse towards a fundamental critique of human culture as such” (Drenthen, 2009). If human beings do not scale up to use their wildness constructively, then wildness becomes an otherness¹⁷ that is avoided. Human beings have rejected the wild character, causing a dichotomy in which the wild character is now an otherness (O’Rourke, 2000). The degree of otherness depends on how far a culture has gone in that dichotomy. Many indigenous peoples who lived in “wilderness areas” for thousands of years, did not feel that wilderness as otherness but rather as home. According to a 1933 Standing Bear quote, he did not see the land as infested with wild animals and ferocious people¹⁸. “To us it was tame” (Callicott, 2000).

The philosophical objection to the declaration of protected wild areas¹⁹ is that it contains an inadmissible human/nature dualism (Keeling, 2008). We should try to eliminate dualism (Borgmann, 1995). There could be a “relaxation of the rigid oppositions between civility and savage character; and ultimately, a human Ego more familiar with its own wild, untamed, and untethered side” (Anderson, 1997).

An obvious requirement of wildness is that an organism should be biologically organized around its internal drives so that it can bring enduring interactions and intentions to its environment. In such a case, a sustainable ecosystem can be developed. However, human beings are not sure of our essence, whether we have inherited instincts, whether we are a clean slate, whether we are motivated by good, evil, selfish genes, God, desires or emotions. We are indecisive and therefore lack the quality and inner clarity necessary to produce the wild character as it appears in other animals.

Other animals may not consciously understand their biological essence either, but they don’t need to. However, we humans need to understand, for our own peace of mind and because the ability to understand is an important component of our package

¹⁶ *Idem. N. of. t.*

¹⁷ “Otherness” in the original. Here it will be translated as “otherness” or “alterity”. This strange philosophical word refers to what is considered as completely different (“the other”) from oneself. *N. of. t.*

¹⁸ “Savage” in the original. “Savage” also means “wild” in English but, unlike “wild” which can have positive or negative connotations depending on the case and apply to people as well as animals, plants or ecosystems, “savage” usually has a negative connotation and it is usually used only to refer to people (mainly primitive human beings -“the savages”-) and sometimes to animals. Here it has been translated as “fierce” to differentiate it from “wild”. *N. of. t.*

¹⁹ “Wilderness designation” in the original. *N. of. t.*

of adaptations. Unfortunately, there may not be an in-between state in the understanding that can bring the necessary stability and quality to the wild character. Either you understand or you don't understand. When our understanding is incomplete, confusion fills in the gaps with misconceptions and ideas, misinterpretations, and lack of awareness. Furthermore, the effects of confusion are aggravated when these ideas are defended with conviction as beliefs and opinions. Much can be overlooked through belief, and many atrocities have been committed in the name of many deceitful causes.

Human beings generally consider ourselves the pinnacle of all species in nature due to our intelligence and achievements. However, some other animals are also quite intelligent and can also do things that we cannot, such as live sustainably, fly, dive deep without help, and obey their true wishes. An alternative view is that the most distinctive feature of human beings is our ability to deceive ourselves (this author included, of course). No other species acts according to scenarios, belief systems and stories created and locked away in their own minds, in which those thoughts can remain untested and yet have great influence. And pretending that our current understanding is free from deception is not very helpful. Indeed, the extent of the human-caused problems plaguing the world today suggests that we lack understanding. We know many aspects (which is why we can exploit so much), but we don't know how to put them together. The most interesting and distinctive biological characteristic of human beings may be confusion, not intelligence.

The idea that we are in a dazed and confused state of mind, even madness, is not new (Shepard & Rawlins, 1998). It is estimated that more than one in five adults in Australia have some type of appreciable mental disorder (Henderson *et al.*, 2000), perhaps fueled by general malaise based on confusion. It has long been noted that human beings lost something good about themselves when they strayed from the ways of nature, as Rousseau (1712-1778) suggested (Mendham, 2011). By circumventing nature's tests for quality we can take liberties and shield ourselves from the reality of life as it happens around us.

The wild character is a process that does not allow confusion, superfluity, falsehood and avoidance. It acts to produce clarity, simplicity and parsimony. The wild character is a way to counteract deception. Our confusion also explains why wildness can be a source of knowledge. It is their own otherness, their independence and ability to offer objective insight that is so valuable. "Not yet subdued by man, his presence refreshes" (Thoreau, 1906).

Quality in external systems

Organizing one's own biological essence in its most direct and simple form is a process based on sobriety (Cookson, 2004). For the wild character, lean efficiency is also required externally, during interactions with the environment. The importance of parsimony in nature is already suggested by the key role of such parsimony in building

evolutionary trees (Stewart, 1993). Improvements in sobriety can happen externally thanks to adaptation to the environment itself, since the animal could receive key and uncontaminated information directly and with minimal effort. It has been suggested that this adaptation, together with poor learning (Jacobs *et al.*, 2009), is key when it comes to acquiring skills (Araujo & Davids, 2011). Adaptive learning should improve the skills and abilities of the individual within the environment associated with it. For example, locating and rescuing lost white children in the Australian outback was often accomplished by "black trackers" as they could read the signs of the land more adeptly than the settlers (Pierce, 1999). . The success rate of moving wild animals to new places from their threatened habitats is low (Griffith *et al.*, 1989), perhaps indicating that these animals are not adapted to the details of their new surroundings and find it difficult to relearn those details as adult animals.

If the quality of the interaction of an organism with its external environment can vary, then there should be a scale that measures these differences and allows to locate the diverse ideas that surround the wild character. Figure 1 suggests a scale; at one end the interactive quality is high, allowing for wildness, at the other, it is dysfunctional and alienated. All positions along the scale are natural; however, the stability of an organism varies along this scale, depending on the quality of the interactions it develops with the other components it encounters. If interactions are poor and there are continual clashes, even for what should be simple tasks (such as searching for food or breeding partners), the current position will be uncomfortable and problematic due to lack of satisfaction from one's achievements and antagonism. with the other components. Therefore, organisms with low-quality interactions will be forced to change quickly, while those with high-quality interactions will have little reason to change. For example, humans are changing rapidly, while some evolutionary lines, such as crocodilians, tuatara²⁰, and stromatolite-producing cyanobacteria, have remained largely unchanged for millions of years. Terror management theory describes a fear of mortality (Cozzarelli and Karafa, 1998) that can be heightened by a human ego that is unable to feel at home within an adapted "mother earth".

²⁰ Reptiles belonging to the genus *Sphenodon*. *N. of the t.*

Presentation of “Wild Nature”

The following is an old text from Ted Kaczynski.

Although in general, in *Naturaleza Indómita* we consider ourselves very similar to the basic ideas of this author (Wild Nature as a fundamental value, rejection of techno-industrial society and modern technology and an attitude contrary to leftism and other forms of reformism), and for this reason we usually publish his texts, normally without presentation, there have always been more or less secondary details with which we do not agree.

In this specific case, the text is one of the first in which the author speaks of its fundamental value: wild nature. And for that alone it is worth being released.

However, it should be noted that, unfortunately, Kaczynski is very given to posing the technological problem as a kind of class struggle in which, on the one hand, there are some powerful (businessmen, scientists, politicians, etc.) who, according to him, supposedly benefit from progress and, on the other hand, there is the rest of the people, who supposedly are victims of the oppression of these powerful elites.¹ In reality, however, the loss of wilderness is a loss for all (both for the loss itself of those wildernesses that progress destroys, and for the consequent loss of true freedom that the existence of vast wilderness brings and it allows). In addition, “upper class” people also pay a price for leading lives increasingly removed from our natural tendencies and habitats (as much or more than “lower class” people).

And on top of that, there is the problem that normal people (the so-called oppressed) what they want mostly is money and comforts like those of the “upper classes.” This is what they consider “wealth” (material and economic wealth) not what Kaczynski refers to in this text, which is a very unusual idea of “wealth”.

And finally, this idea that there is an upper class that benefits from progress is an idea that attracts leftists a lot because it fits very well with their ideas, something that Kaczynski ironically has always tried to avoid (at least in theory).

¹ Another text by the same author and much more recent (2016) in which this trend can be clearly seen is “The long-term consequences of geoengineering” [<https://www.naturalezaindomita.com/textos/critique-of-civilization-and-the-techno-industrial-system/the-long-term-consequences-of-geoengineering>][<https://www.naturalezaindomita.com/textos/critique-of-la-civilizacin-y-del-sistema-geoingenieria>][<https://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/las-consecuencias-a-largo-term-de-geoingenieria>][<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-sistema-tecnoindustrial/las-consecuencias-a-largo-term-de-geoingenieria>].

Wild nature[2,3]

By Theodore J. Kaczynski

I am a US citizen and I am traveling through Canada. Reading some brochures and some notes printed on the road maps, I couldn't help feeling astonished at a certain contradiction in the Canadian attitude. On the one hand, the brochures express enthusiasm about the wonders of untouched wilderness: "There are trees everywhere, hundreds of lakes and streams not yet mapped... they treasure the lonely grandeur of a vast territory where nature has not been disturbed". On the other hand, many Canadians seem to yearn to exploit the wilderness. Some brochures boast of "flourishing settlement," industrial "spreading," and the extension of highways deeper and deeper into wilderness. You should realize that one cannot eat a cake and have it at the same time. Preserving a few islands of wilderness in the form of parks is not enough, as the example of the western US demonstrates. There is still some wilderness there, but the number of people wanting to use those wilderness areas is growing by leaps and bounds as the wilderness itself is shrinking.

It is getting harder and harder to escape the crowds, even when you walk several miles into a declared "primitive" area, and it seems that if you want to completely preserve some wilderness you will eventually have to require permits to enter the areas. protected wild.

You guys try fishing in the US You'll be lucky if you catch anything. In order to have the kind of opportunities that Canada still offers, you need to have really huge tracts of untamed forest and a reasonably small national population.

If I were Canadian, I would support laws that oppose population growth and the expansion of the highway system. Look at it this way. The more people there are, the less land and natural resources there will be for each person. What many people in the US are beginning to realize now that it is too late is that population and industry growth is good for businessmen because it helps them *make* rich, but not good for ordinary people. The problem is that some Canadians don't seem to know how rich they already are!

Excerpt from a letter from Ted Kaczynski to an anonymous person, about Wild Nature, deep ecology and more[a]

[In response to your letter of 05-21-2003]:

First, I will respond to your comments about anger and anarchists in general [...]. You reject rage as a reason for wanting to change the system and describe it as an "anthropocentric" motive. I agree with your rejection of anthropocentrism: that is, I agree that the well-being of the wild nature, or the biosphere, or the whole of life on Earth, or whatever you want to call it, has to be an end in itself. itself and not just a means of satisfying human needs. In other words, the welfare of wilderness comes *first* and the satisfaction of human needs comes *second*.

However, human beings, and human needs, emotions and drives, cannot be left out of the equation. We have to think about human beings since human beings are the origin of the problem. It's not deer, wolves, snakes, mosquitoes, or tapeworms that are fucking up the world, it's *people*. To solve the problem we have to work with *people*. [b] And to do it successfully we have to think about human nature even more than we think about wild nature. We have to ask ourselves questions such as: What is it that leads a person to give more value to wild nature than to human well-being? What can motivate a person to fight the system for the love of wilderness, and to do so even at great personal sacrifice?

Speaking for myself, my own devotion to wilderness stemmed from the fact that living close to it satisfied my deepest needs. It gave me freedom, it gave me meaningful work, it gave me peace of mind, and it offered me a beauty that no human work of art could even remotely approach. It gave me all these things and more, in the form of an integrated whole and as a way of life. Consequently, it gave me a feeling that life was satisfying and worth living.

So I came to love wild nature because of what it gave me. You can call this anthropocentrism if you like, but I don't think anyone ends up compromising with nature merely by divine design. I think people end up engaging with nature because of what it gives them. I would wager that you have committed yourself to the wilderness because of what it has given you.

[a] Translation by Último Reducto of letter dated July 1, 2003. Original in English. Available in:

[<https://drive.google.com/file/d/1iDM0tBTbACdErQ4zro3NoL8LDm8OME5R/view?usp=sharing>][<https://drive.google.com/file/d/1iDM0tBTbACdErQ4zro3NoL8LDm8OME5R/view?usp=sharin>][<https://drive.google.com/file/d/1iDM0tBTbACdErQ4zro3NoL8LDm8OME5R/view?usp=sharing>][g.] Copyright © 2003 Theodore John Kaczynski.

[b] “With or on *people*” in the original. Given that in Spanish both things are expressed with the preposition “con”, it is necessary to clarify that what Kaczynski says here would literally mean working with people as a partner and with people as work material, as material to mold and modify or on which to work. that at least influence. *N. from t.*

However, when the experience with nature goes far enough, you develop a reverence for it and begin to love it for itself, not just for what you get from it. In other words, it goes beyond anthropocentrism. No matter what the process by which that point is reached, it *begins* with the satisfaction of nature’s own human needs.

Also, I think we have to recognize that there are many people who want to get rid of the techno-industrial system for purely anthropocentric reasons, that is, because the system is bad for human beings. I don’t think we should reject alliances with such people - as long as they are truly committed to getting rid of the system and are willing to accept the temporary damage getting rid of the system will bring to the human race.

Even for those who have gone beyond anthropocentrism it is easy to say, “There is nothing I can do” and therefore give up and adopt a passive and resigned attitude. Many people who really love nature do exactly that. And it cannot be said that his attitude is irrational. It is extremely difficult to fight the system; you have to work against all odds, so why worry? What would motivate someone to maintain a fight against such unfavorable odds?

I can tell you what motivates *me* to keep fighting: anger.[c] And I have a pretty strong suspicion that anger also has a lot to do with your willingness to keep fighting. sample. The difference between you and the anarchists is that your rage is controlled and a productive source of energy and determination, whereas most American anarchists (at least most of those I know anything about) are thoughtless people. and disorganized with a severe self-control deficiency. They take out their anger in an absurd and indiscriminate way. They do stupid things like smash McDonald’s windows, or swear and play loud music just to annoy people. They pretend to be revolutionaries, but most of them are not fit to be serious revolutionaries. (Of course there are exceptions).

Like you, I dislike these kinds of people, and I think most of them are hopeless. They will never learn, as they simply lack the ability to self-control.

[...]

As for *Deep Ecology for the 21st Century*,[d] for several years, until maybe a year ago, I had a copy of that book here with me. I read only part of it - much less than

half - and what I did read I did not like. I kept the book mainly because I wanted to write a review of it, but never had time, and eventually got rid of it to make room for other books.

I don't remember exactly which parts of *Deep Ecology for the 21st Century* I read, but I do know that, among other things, I read an essay by Arne Naess. I'll tell you why I didn't like it, but keep in mind that I'm basing myself on my memory of what I read several years ago, and my memory could fail [...].

[c] "Anger" in the original. *N. from t.*

[d] George Sessions (ed.), Shambhala, 1995. *N. from t.*

If I remember correctly, Arne Naess, the founder of Deep Ecology, says something similar to the following:

Deep Ecology is a philosophy that prioritizes the well-being of the global ecosystem (call it wilderness if you prefer) over human well-being. However, Naess says that if concessions to the well-being of wilderness need to be made to save human lives, they should be made because (according to him) every species should take care of itself. Furthermore, it seems clear that what Naess has in mind for the human race is something of a stewardship role: the human race is supposed to care for other species and keep the global ecosystem healthy. His hope is that the philosophy of Deep Ecology will spread slowly; according to Naess it will take hundreds of years to prevail. Nowhere does Naess suggest that modern industrial society should be done away with. And it does not offer the followers of Deep Ecology any clear, defined, concrete and comprehensive goal anywhere.

I'll mention the most obvious criticism first: Trusting a philosophy that is expected to take hundreds of years to spread is stupid, since hundreds of years from now there will be little, if anything, left to salvage.

Second, Naess's position that, if necessary, human lives must be preserved even at the cost of damaging ecosystems, is inconsistent with his position that the well-being of ecosystems must take precedence over human well-being. If the well-being of the global ecosystem comes before human well-being, many people are going to die as a result. We know that economic growth and so-called "progress" are ruining the wilderness. If wild nature is to be saved, then this disease of growth and progress must be stopped and it must be stopped as soon as possible. The consequences of stopping it will be disastrous: as any economist will tell you, if you go from economic growth to economic contraction, the world economy as a whole will go down the drain. There will be mass unemployment, acute shortages of goods and, consequently, a collapse of the social order and, in many parts of the world, armed revolts and wars. Even today there is already a lot of this in the world. If the world economy collapses, the situation will become much worse. See the Manifesto,[e] paragraphs 111, 167 and 194. Therefore, getting rid of the disease of growth and progress is likely to involve a massive loss of human life; which, according to Naess's philosophy, should not be allowed to happen. Therefore, defending the need to protect human life will prevent deep ecologists from taking measures that are drastic enough to get us out of the quagmire we are in.

Next, Naess's position that the human race should exercise stewardship over the natural world implies that in practice the human race should continue to dominate the rest of the global ecosystem; the only real change proposed by Naess is that henceforth human beings are supposed to exercise their power over nature in a benevolent and restrained way rather than in the ruthless exploitative way it is today.

[e] Kaczynski refers to his text "Industrial Society and Its Future", often also called the "Unabomber Manifesto". It was originally published in 1995. The updated version is available at *Technological Slavery*, Fitch & Madison, 2019. [There is a Spanish edition of the original version: *Industrial society and its future* ,[<http://isumatag.blogspot.com/p/el-manifiesto-de-unabomber.html>][Isumatag,] 2011]. N. from t.

Personally, I am not prepared to accept under any circumstances that human society should continue to dominate wild nature. But even if human rule over nature is not in itself considered questionable, its *consequences* should certainly be considered questionable: Naess's belief that human society can retain its power over nature nature, and yet to exercise such power benevolently and sparingly, is wholly unrealistic. It just isn't going to happen. The philosophy of Deep Ecology will never govern the development of our society.

Naess has fallen into an extremely widespread error: the belief that the development of a society can be guided or directed by the implantation of a code, principles, a philosophy or the like by which people are supposed to govern your behavior. History has shown that *you cannot* control the development of a society. See Manifesto, paragraphs 99-109. Still less can the development of a society be controlled by the introduction of a philosophy or a set of principles. This has been tried over and over and *never* worked. The Russian revolutionaries tried to establish a society governed by their socialist principles and we all know how that ended. The early Christians took equality, peace, justice, and so on as their principles, but as soon as they had the chance to make a deal with Emperor Constantine, they sold out. Then, after the fall of Rome and throughout the Middle Ages, the supposedly gentle Christian religion presided over a particularly violent time in European history. Islam, too, began with the principles of equality and justice, but it did not end better than Christianity: "At the end of the term of the 'rightly guided' caliphs, the Prophet's dream of ushering in a new era of equality and social justice remained unfulfilled ..¹ The French revolutionaries completely failed to establish a new society that conformed to their ideals. Similarly, Latin American revolutionaries failed to see their principles realized in a new form of society. At the end of his life, Bolívar wrote with discouragement "he who serves a revolution plows in the sea."² (It is true that the Latin American revolutionaries "plowed in the

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

sea”, in the sense that they failed to establish the new order they dreamed of, although they did *succeed* at 3 the hour of destroy the old order).³

I could go on listing many such examples. Trying to impose principles on a society always fails. The typical pattern is that idealistic revolutionaries commit to certain principles and usually remain faithful to those principles. However, once the revolution reaches power and the idealistic first generation of revolutionaries dies (or even before this happens), those who are more interested in power than in principle take control of the situation. The principles are then abandoned, twisted, or reinterpreted so that they no longer serve the purposes of the original idealistic revolutionaries. That is what happened with Christianity, Islam, the various communist revolutions, the Latin American revolutions, the Reformation and the 20th century revolts against colonialism (look at what has happened with Africa, for example).

The same will happen with Deep Ecology. As long as it is a little-known ideology, of an idealistic minority, its supporters will be able to remain faithful to its principles. But if it ever becomes the dominant ideology in society, its principles will be distorted or reinterpreted in such a way as to render them ineffective. It is what always happens.

Therefore, Naess’s proposal to change society by propagating the philosophy of Deep Ecology is nothing more than a pipe dream. Any attempt to direct the development of a society by introducing philosophical principles, to which people are supposed to remain faithful for centuries, is a pipe dream. People may continue to say that they are true to those principles, but in practice most of them will not behave according to those principles for very long.

However, as I have already pointed out, the initial idealistic generation of revolutionaries often do stay true to their principles. So we have to ask what that initial generation of revolutionaries can do that will have a lasting effect *without* requiring subsequent generations to remain true to revolutionary principles. In our case the answer to this question is clear: the revolutionaries must destroy the techno-industrial system. Although revolutionary movements have never succeeded in definitively establishing the new order they dreamed of, they have often succeeded in destroying the old order of society. Thus, historical precedent suggests that it may be possible for a revolutionary movement to destroy the techno-industrial system.

Deep Ecology is not merely futile. It actually prevents the formation of a genuine revolutionary movement, since it offers an easy way out: all you have to do is preach the philosophy and engage in small reformist actions, no one gets hurt, no one has to take big risks, and all will be well. Supposedly. In this way Deep Ecology serves as a kind of lure that attracts people and energy towards activities that are ultimately useless. Thus, Deep Ecology keeps busy those people who might otherwise contribute to the formation of a genuine revolutionary movement, wasting their energy. The same is true

³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

of any ideology that does not advocate the complete abolition of modern industrial society. This is why we must distance ourselves from all those ideologies.

Another problem with Deep Ecology: As far as I can remember, Arne Naess does not propose any concrete, clearly defined and comprehensive goals for deep ecologists. This alone is probably enough in itself to ensure the failure of Deep Ecology. Vaguely defined goals such as freedom [...or] (in this case) “Deep Ecology” are useless, as people simply reinterpret vaguely defined goals to suit their own needs at the moment. An experienced community activist has written: “Vague and overly general goals are rarely met. The trick is to come up with some concrete change that will inevitably push your community in the direction you want it to go.”⁴ That particular change is to do away with modern technology. When we say that there have to be no computers, automobiles, electric power networks, etc., etc. that is clear and unequivocal enough so that there is no doubt what we mean. It is a goal that cannot be reinterpreted in such a way that it is neutralized. As far as I know, Deep Ecology does not have such a clear, defined and unmistakable goal.

Yet another problem with deep ecology is that it smacks of leftism. You yourself pointed out, with different words, that you smelled like that. Why is this important? Because that scent attracts leftists. For the purpose at hand we can define leftists as those people who are usually attracted to causes. They do not care what the cause is - any cause will do as long as it is not openly incompatible with the ideology of the left. This is why you can find people who are involved in a dozen different causes at the same time.

(For example, Judi Bari,[f] see Martha F. Lee, *Earth First!: Environmental Apocalypse*, Syracuse University Press, 1995, page 119). They don't really care about any of these causes, because their real motive is not to bring about any concrete change in society but to satisfy their own psychological needs by participating in a movement. See the Manifesto, paragraphs 213-226. These people are extremely plentiful in our society and swarm over any cause like flies swarming fresh shit. You know what they did to Earth First!, and they will do the same to us unless we try very hard to avoid it. We have to be especially careful to avoid anything that smacks of leftism because it will attract these people. And this alone would be enough to make me suspicious of any relationship with Deep Ecology.

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

Grades:

18. Rafiq Zakaria, *The Struggle Within Islam*, Penguin Books, London, 1989, page 59.

19. *Simón Bolívar, Political Writings*, edited by Graciela Soriano, Alianza Editorial, Madrid, 1975, page 169.[g]

20. As Soriano points out on page 41 of the work cited in Note 2, “Although there is no doubt that [Bolívar] had succeeded in destroying the old order, it seems that he failed in establishing the new order”.[h]

21. John Huenefeld, *The Community Activist’s Handbook*, Beacon Press, Boston, 1970, page 6.

[f] In the original letter the name was deleted. However, it is clear who Kaczynski is referring to, because on page 119 of the aforementioned book, Lee describes Judi Bari, one of the main culprits behind the drift of Earth First! toward leftism, as someone involved in a number of different causes: anti-nuclear movement, anti-imperialism, environmentalism, and feminism, to say the least. *N. from t.*

[g] This quote is a Spanish translation made from Kaczynski’s English translation of the original Spanish quote, so some words may not match the original quote. *N. from t.*

[h] *Ditto. N. from t.*

2. Texts on ecology .

The texts included in this section deal with the state of the biosphere. And, although their authors often foolishly promote the management of Nature and the technological interference with it in order to "solve" the ecological problems caused by previous interventions, we believe that these texts serve as sources of data when it comes to making a realistic idea of the global ecological situation.

- Human domination of the Earth's ecosystems. By Peter M. Vitousek, Harold A. Mooney, Jane Lubchenco, and Jerry M. Melillo.

- The crisis of biodiversity and the future of evolution . By Norman Myers.

- Maintain habitats that depend on disturbances . By Laetitia M. Navarro, Vânia Proença, Jed O. Kaplan, and Henrique M. Pereira.

- The last frontiers of the wild lands. By Peter Potapov, Matthew C. Hansen, Lars Laestadius, Svetlana Turubanova, Alexey Yaroshenko, Christoph Thies, Wynet Smith, Ilona Zhuravleva, Anna Komarova, Susan Minnemeyer, and Elena Esipova.

- The architecture of nature. By JM Montoya, RV Solé, MA Rodríguez

- Let's protect what remains of wild nature. By James EM Watson, James R. Allan, and colleagues.

- Approaching a change of state in the Earth's biosphere. By Anthony D. Barnosky, Elizabeth A. Hadly, Jordi Bascompte, Eric L. Berlow, James H. Brown, Mikael Fortelius, Wayne M. Getz, John Harte, Alan Hastings, Pablo A. Marquet, Neo D. Martínez, Arne Mooers , Peter Roopnarine, Geerat Vermeij, John W. Williams, Rosemary Gillespie, Justin Kitzes, Charles Marshall, Nicholas Matzke, David P. Mindell, Eloy Revilla, and Adam B. Smith

- Quantifying and mapping the human appropriation of the primary production of the earth's terrestrial ecosystems . By Helmut Haberl, K. Heinz Erb, Fridolin Krausmann, Veronika Gaube, Alberte Bondeau, Christoph Plutzer, Simone Gingrich, Wolfgang Lucht, and Marina Fischer-Kowalski

Presentation of “HUMAN DOMINATION OF EARTH ECOSYSTEMS”

When dealing with situations that refer to a broad and general scale, it is often difficult to know what part of what is said, read or heard is really in line with reality and what part is excessive or deficient. Contrary to what happens with concrete and immediate situations, it is not possible to know first-hand all the facts and it is necessary to rely, in the best of cases, on intuition. And intuition is often heavily influenced by non-rational factors and/or non-experimental assumptions. It is not difficult, then, to see things worse than they really are or, on the contrary, to maintain a deluded and unjustified optimism.

The main reason for publishing the article that we present below is that it is a text that presents in a serious and realistic way, based above all on concrete empirical data, the general situation in which the Earth’s ecosystems find themselves. And this, leaving intuitions aside and sticking to the facts presented in the text, is not exactly a flattering situation.

Moreover, the article presents the situation in which the biosphere found itself more than twenty years ago. Has the general situation outlined in the article improved during this time? If we take into account the specific parameters that the text uses to elaborate its general model of the situation of the biosphere, we will see that practically none of them has evolved towards a lower incidence in the destruction or alteration of ecosystems, but rather the opposite: practically all have increased their intensity and, with it, their negative impact on the self-regulation of ecosystems.

In other words, the value and interest of this article lies in the fact that it offers empirical evidence to maintain that the global ecological situation is really disastrous and shows that affirming the latter is not ecological catastrophism, but mere realism, rational and scientific.

However, not everything is virtues in this article. There are also some aspects that can be questioned. In general, the fundamental defects of this article are the same as those of many other texts on ecological issues: the lack of awareness and clarity of ideas about how the development of societies and technology really works when interpreting the ultimate causes of the problems and propose solutions to them and, closely related

to the above, the absolute lack of questioning of technological progress, which ironically is presented as a solution to the problems that it actually causes or aggravates.

Thus, the authors suggest three directions in which to act:

- (i) *Reduce the rate of alteration of ecosystems.*
- (ii) *Accelerate research on ecosystems and how they interact with human activities.*
- (iii) *Accept the need to manage the planet.*

Suggestion (i) according to the authors, would be achieved by reducing the so-called “ecological footprint”, by slowing down population growth and increasing efficiency when using resources. The main error of this proposal is that the fundamental problem is not that human beings are mismanaging their activities and their population growth rate, the underlying problem is that human societies in general, and even more so the more complex they are, are develop, over the long term, in a way beyond the will and control of human beings. At this point, proposing solutions, such as the one suggested by the authors, based on a rational management of society and its activities is completely unrealistic.

Leaving aside this serious error, it is also necessary to point out the vagueness of the suggestion that in no case clarifies in detail the methods by which said proposal is supposed to be carried out. In the end, everything remains in the typical declaration of good intentions with which these types of texts usually close formally. On the other hand, perhaps it is better this way, since most of the proposals aimed at improving efficiency in the use of resources are based on promoting technological development, not on stopping it and, looking at the other two suggestions, it is obvious that the proposals that the authors of this article are thinking about will not be an exception. As we shall see, the authors are not thinking of reducing population growth or the impact of human activities by means other than the development and application of more efficient and thus more complex and interdependent technologies. In other words, they are thinking of promoting greater development of the techno-industrial system and an increase in its impact on ecosystems.

That scientists propose to increase research as part of the solution to the problems they deal with in their studies -suggestion (ii)- is a topic of practically the entire scientific literature, which is usually motivated, rather than by the real utility of such research, due to the need that scientists often have to justify, promote and maintain their own activities. In the case at hand, it is more than questionable that a better understanding of how human activities influence ecosystems and how they self-regulate will serve to save and preserve them. Scientists may be able to tell us more and more about the damage ecosystems are suffering, but that in itself will not make them stop suffering, because the cause of ecological problems is not so much ignorance about the functioning of ecosystems as the inevitable material consequences of social and technological development. An industrial society will always be much more damaging to non-artificial ecosystems than a non-industrial society, even if the former is inhabited exclusively by individuals and groups committed to environmentalist ideals such as “sustainable development” and the application of new technologies. clean” and the

second by individuals who do not care about the environment completely. Because the core of the problem does not lie in ideology (although this is relatively important) but in the material infrastructure of society, that is, it lies in the scale at which a society can and should interfere in the self-regulation mechanisms of ecosystems. in order to obtain the necessary resources to support themselves physically. This is another of the fundamental errors of “green” thinking: not being able to see that technological development inevitably leads to ecological damage, even when it is supposed to prevent it. Simply, at best, problems are displaced or blurred, moving from one aspect or process to another, from the immediate to the distant, from the concrete to the general, etc. “Clean” industrial technologies (along with the huge industrial complex and large population they support and require) do not appear out of nowhere, nor do they operate solely on their own inertia, nor do their wastes and products simply disappear. They must be produced, fed, maintained and their waste treated, always using, in one way or another, space, raw materials and energy obtained from the natural environment, that is, causing an ecological impact. Links (technologies to “clean up” other technologies) and loops (recycling waste) can be added to the chain, but the chain will always have a beginning (use of space and extraction of materials and energy) and an end (release of waste). And those extremes reach their maximum in a techno-industrial society, no matter how “green” it may be. All this without going to talk here about the direct and inescapable relationship between technological development and the reduction of true human freedom (autonomy in the expression and satisfaction of the tendencies, needs and capacities of the individuals of our species), with the inevitable disorders accompanying psychological

In fact, when the authors speak of the need to learn more about “how humans interact with ecosystems”, they are not thinking of scientifically testing the belief in the compatibility between technological development and the maintenance of human autonomy. ecosystems, but on something very different: using scientific research to justify, facilitate and optimize the management and technological intervention in the self-regulation mechanisms of ecosystems.

This is made clear by suggestion (iii). After showing throughout the entire article the magnitude and seriousness of the domination suffered by non-artificial ecosystems, the authors curiously conclude that they must continue to be dominated, more and better, in order to save them. Apart from the reasons indicated above for the other suggestions (impossibility of rationally controlling the development of a society, imposture of the “green” discourse, etc.), this suggestion is unacceptable if only because it contains a patent incompatibility between the values in which is apparently inspired: according to the authors, to preserve the wild, that is, the untamed... you have to master it! How is it possible that people who are supposed to be part of the intellectual elite of society fall into such gross logical inconsistency?

It is too common among many scientists not to take the conclusions of their studies to their final logical consequences, but rather the opposite. When it comes to drawing conclusions from their research, many scientists tend to be extremely timorous, even if

this means falling into irrationality and logical incoherence. Despite often presuming otherwise, scientists are often more interested in their own career, their prestige within their professional environment, and their social standing than in discovering and exposing the truth. If at any time, the conclusions of their research openly clash with the fundamental values, beliefs and purposes of their social environment, most scientists will choose, consciously or unconsciously, to respect the latter, even if this means leaving aside the truth, the reason, logic and facts; or twist them beyond recognition. And closely related to the above, if the social environment of scientists promotes certain values or ideas, scientists will tend to defend them, repeat them and take them as a reference and justification in their studies, even if doing so also implies an attack against logic and truth. . The authors of this article are no exception, and the defense of technological development is one of the fundamental ideals of this society and, with it, of the scientific world. Just as the “green” discourse that tries to make us believe in the compatibility between industrial development and respect for ecosystems is also increasingly valued by this society. This explains why the authors try to show concern about the state of non-artificial ecosystems despite not questioning, not for a moment, technological development and end up defending that it is necessary and inevitable to manage ecosystems.

Necessary for what? To save those same ecosystems or to save and maintain the techno-industrial society? When an ecosystem is managed it ceases to be wild. In other words, management does not save what really makes an ecosystem valuable: its capacity for self-regulation, its autonomy, but rather cancels it, or at least reduces it and makes it difficult. Inevitable? Only if the alternative option (which would be the really necessary and effective one, although today “socially incorrect”) is conveniently ignored, as the authors do: abandoning technological development.

Social and technological development causes problems and in turn offers apparent solutions that generate an increasing dependence on it. Dependence that those who do not really value freedom, independence and the wild (as is the case of the authors of the article) assume as necessary and inevitable or even good.

In short, the article is interesting only as a scientific description of the state of the biosphere. And nothing more.

HUMAN DOMINATION OF EARTH'S ECOSYSTEMS

By Peter M. Vitousek, Harold A. Mooney, Jane Lubchenco, and Jerry M. Melillo[a]

The alteration of the Earth is considerable and increasing. An area between one third and one half of the earth's surface has been transformed by human activity; the concentration of carbon dioxide in the atmosphere has increased by about 30% since the start of the Industrial Revolution; humanity is fixing more atmospheric nitrogen

than all natural terrestrial sources combined; more than half of all fresh surface water is being used by humanity; and about a quarter of Earth's bird species have been driven to extinction. By these and other parameters, it is clear that we live on a planet dominated by humans.

[a] Translation by Último Reducto of the original article "Human Domination of Earth's Ecosystems", published in *Science*, vol. 277, July 25, 1997. *Translator's note*.

All organisms modify their environment and humans are no exception. As the human population has grown and the power of technology has expanded, the scope and nature of this modification have changed dramatically. Until recently, the expression "human-dominated ecosystems" would have suggested images of agricultural fields, pastures, or urban landscapes; now it applies to a greater or lesser extent to the whole Earth. Many ecosystems are directly dominated by humanity and no ecosystem on the earth's surface is free from widespread human influence.

This article provides an overview of human-induced effects on Earth's ecosystems. It's not meant to be a boring list of environmental disasters, although it does describe some disastrous situations; nor is it designed to belittle or celebrate environmental successes, of which there are many. Rather, in it we explore how extensive the human presence on the globe is—how, even on a large scale, most aspects of the structure and functioning of Earth's ecosystems cannot be understood without take into account the strong, often dominating, influence of humanity.

We see human alterations of the Earth system operating through the interaction of the processes summarized in figure 1. The growth of the human population and the increase in the resource base used by humanity are maintained by a series of human activities, such as the agriculture, industry, fishing and international trade. These activities transform the earth's surface (through cultivation, logging and urbanization), alter major biogeological cycles, and add or remove genetically distinct species and populations in most of Earth's ecosystems. Many of these changes are large and reasonably well quantified; all of them are being produced now. These relatively well-documented changes in turn lead to further disruptions in the functioning of the Earth system, notably driving climate change¹ and causing irreversible losses of biological diversity².

Land transformation

The use of land to obtain goods and services represents the most profound alteration of the Earth system by humans. Human use of the land alters the structure and functioning of ecosystems and alters the way ecosystems interact with the atmosphere, with aquatic systems, and with surrounding territories. Furthermore, land transformation interacts strongly with most other components of global environmental change.

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity*.

² Original title: *The Vanishing face of Gaia*.

Quantifying land transformation on a global scale is challenging; change can be measured more or less directly in a given location, but it is difficult to add up these changes regionally or globally. Contrary to what happens with the analysis of the alteration of the global carbon cycle, we cannot install instruments on a mountain in the tropics to collect data on land transformation. Remote sensing is a more useful technique, but only recently have serious scientific attempts been made to use high-resolution images from civil satellites to assess on continental and global scales at least the most visible forms of land transformation, such as example deforestation.³

Land conversion involves a wide variety of activities that differ substantially in intensity and consequences. At one extreme, between 10 and 15% of the land area not occupied by the sea is occupied by farmland or by urban-industrial areas, and between 6 and 8% has been converted to pasture⁴. ; these systems have been completely transformed by human activity. At the other extreme, all terrestrial ecosystems are affected by the increase in atmospheric carbon dioxide (CO₂) and many ecosystems have behind them a history of hunting and other forms of resource extraction. low intensity. Between these extremes are the grasslands and semi-arid ecosystems that are grazed (and sometimes degraded) by domestic animals and the forests and woodlands from which products have been extracted, which represent the majority of the Earth's surface that is It is covered with vegetation.

The diversity of the effects that human beings cause in the territory turns any attempt to globally summarize the transformation of the earth's surface into a semantic question as well as something deeply imprecise. Estimates of the percentage of land that has been transformed or degraded by humanity (or as a consequence, the percentage of the biological production of the land that is used or dominated) is between 39 and 50% (Figure 2).[5] These figures are very imprecise but the fact that they are high is very true. Furthermore, these estimates in any case underestimate the global impact of land conversion since often unconverted land has been broken up into fragments by human disturbance of surrounding areas. This fragmentation affects the species composition and functioning of ecosystems that have been little modified in other ways.⁵

Above all, land conversion represents the main cause of biodiversity loss globally. Also, the effects of land transformation go far beyond the boundaries of the transformed lands. Land transformation can affect climate directly at a local, and even regional, scale. It contributes approximately 20% to current anthropogenic CO₂ emissions and

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ A couple of examples:

an even higher percentage to the increasing concentrations of other greenhouse gases such as methane and nitrous oxide; fires associated with it alter the reactive chemistry of the troposphere, causing elevated concentrations of carbon monoxide and episodes of photochemical air pollution similar to those in urban areas in remote tropical parts of Africa and South America; and causes sediment and nutrient entrainment, which in turn causes changes in river and lake systems, in estuaries, and on coral reefs.[7-10] bird nitrogen CO₂

Fig. 2. *Human dominance or alteration of various major components of the Earth system, expressed (from left to right) as a percentage of land area transformed⁶; percentage of the current concentration of CO₂ derived from human activity⁷; percentage of accessible fresh surface water used⁸; percentage of terrestrial nitrogen fixation caused by humans[28]; percentage of plant species that have been introduced to Canada by humans from elsewhere⁹; percentage of bird species that have become extinct in the last two millennia throughout the Earth, almost all of them as a result of human activity[42]; and percentage of the main marine fishing grounds that are being fully exploited, are overexploited or have been depleted¹⁰.*

The central importance of land transformation is widely recognized within the research community concerned with global environmental change. Various research programs focus on aspects of it[9,11]; Significant advances¹¹ have recently been made in

⁶ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

⁸ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

⁹ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

¹⁰ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹¹ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

understanding these aspects and it can be predicted that many more will be achieved. Understanding land transformation is a difficult challenge; it requires integrating the social, economic and cultural causes of land transformation with assessments of its nature and biophysical consequences. This interdisciplinary approach is essential for predicting the course, as well as harboring any hope of influencing the consequences, of human-induced land transformation.

The oceans

Disturbances of marine ecosystems caused by humans are more difficult to quantify than those of terrestrial ecosystems, but certain types of information suggest that they are considerable. The human population is concentrated near the coasts - around 60% in a 100km strip - and the productive oceanic coastal margins have been strongly affected by human beings. Extensive areas of coastal wetlands, which act as mediators in the interactions between land and sea, have been altered; for example, approximately 50% of the planet's mangrove ecosystems have been transformed or destroyed by human activity.[353] In addition, recent analysis suggests that despite the fact that humans use about 8 % of the primary production[b] of the oceans, this percentage reaches more than 25% in the upwelling areas[c] and 35% in the continental shelf systems of temperate zones.[354]

Many of the fisheries that capture marine productivity target apex predators[d], the removal of which can alter marine ecosystems far more than would initially be expected given their low abundance. Furthermore, many of these fisheries have proven to be unsustainable, at least with the level of knowledge and control that we currently have. Already in 1995, 22% of the recognized marine fishing grounds had been over-exploited or had already been depleted and another 44% were at the maximum limit of exploitation (Figures 2 and 3).[355] The consequences of fisheries are not limited to the organisms that are their target; Worldwide, commercial marine fisheries discard 27 million tonnes of animals per year, belonging to captured but unwanted species, an amount close to a third of the total landed.[356] Furthermore, the dredges and trawls used in some fisheries significantly damage habitats by sweeping the seafloor.

A recent increase in the frequency, extent, and duration of harmful algal blooms in coastal areas[357] suggests that human activity has affected both the bottom and the top of marine food webs . Harmful algal blooms are sudden increases in the abundance of marine phytoplankton that produce harmful structures or chemicals. Some, but not all, of these phytoplankton species are strongly pigmented (red tides). Massive appearances of algae are usually related to changes in temperature, nutrients or salinity; in particular, nutrients in coastal waters are highly affected by human activity. Algal blooms can cause massive fish kills due to the toxins or anoxia they produce; They can also cause paralysis and amnesia in humans through poisoning caused by eating

shellfish contaminated by these algae. Although the existence of algal blooms has been known for a long time, they have spread widely in the last two decades.¹²

Alterations in biogeochemical cycles

Carbon. Life on Earth is based on carbon, and CO₂ in the atmosphere is the main source for photosynthesis. Humanity adds CO₂ to the atmosphere through the extraction and burning of fossil fuels, the residues of life from a distant past, as well as by converting forests and grasslands into agricultural fields and other ecosystems of low biomass content. The net result of both activities is that organic carbon from rocks, organisms, and soils is released into the atmosphere as CO₂.

The modern increase in CO₂ represents the clearest and best-documented sign of human alteration of the Earth system. Thanks to the farsightedness of Roger Revelle, Charles Keeling, and the rest of those who began making careful and systematic measurements of atmospheric CO₂ in 1957 and continued to do so despite funding crises and changes in scientific trends, we have observed that the concentration of CO₂ has increased continuously from 315 ppm[e] to 362 ppm. Analyzes of air bubbles drawn from the ice caps of Antarctica and Greenland push the record back much further; the concentration of CO₂ remained more or less stable, around 280 ppm, for thousands of years until around 1800, and has increased exponentially since then.¹³ There is no doubt that this increase has been caused by human activity, mainly by the burning of fossil fuels today. CO₂ sources can be traced using isotopes; prior to the period of extensive nuclear testing in the atmosphere, carbon converted to [358]C (carbon-14) was a specific indicator of CO₂ derived from the burning of fossil fuels, while carbon transformed into¹⁴C (carbon-13) characterized CO₂ from both fossil fuels and land transformation. Direct measurements in the atmosphere, as well as analyzes of carbon isotopes in tree rings, show that both¹⁵C and¹⁶C of CO₂ have been left behind diluted

¹² By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹³ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁴ Examples:

¹⁵ Examples:

¹⁶ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor,

in the atmosphere compared to¹⁷C (carbon-12) as the concentration of atmospheric CO₂ has been increasing.

Burning of fossil fuels currently adds 5.5 (with an error of + 0.5) billion tons of CO₂ to the atmosphere each year, the majority in economically developed regions from temperate zones (Figure 4).¹⁸ The annual accumulation of CO₂ has recently reached 3.2 (with an error of +0.2) billion tons.¹⁹ The other main parameters of the atmospheric carbon balance are the net flux between the ocean and the atmosphere, the net release of carbon during land conversion, and the net storage as terrestrial biomass and soil organic matter. All of these parameters are smaller and less precise than the burning of fossil fuels or the annual atmospheric accumulation; they represent promising areas for current research, analysis, and discussion.

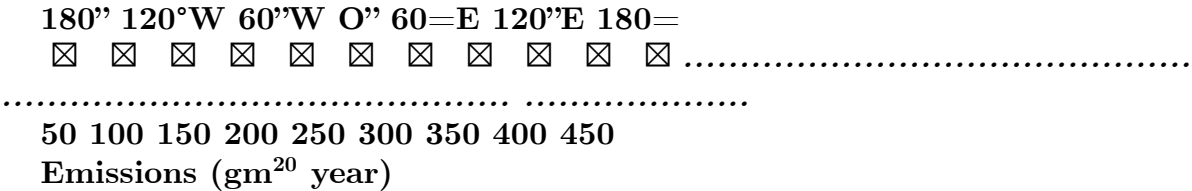


Fig. 4. *Geographical distribution of sources CO₂ from fossil fuels in 1990. The global average is 12.2 gm[-2] year 1]; most emissions occur in economically developed regions of the temperate zone of the northern hemisphere. EQ, equator; NP, North Pole; SP, South Pole. [Prepared by AS Denning, from information in reference 18].*

The human-induced increase in atmospheric CO₂ already represents a change of almost 30% compared to the pre-industrial era (Figure 2) and, as far as we can predict, CO₂ will continue to grow in the future. The increase in CO₂ represents the most important human-induced increase in the greenhouse effect; consensus among climate researchers is that it probably already has a detectable effect on climate and will lead to significant climate change in the next century.²¹ The direct effects of increased CO₂ on plants and ecosystems may be even more important. The growth of most plants is favored by an increase in CO₂, but in very different measures; the chemistry of plant

etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁷ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹⁸ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

¹⁹ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it*" (*The Earth is Running Out*, page 88).

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²⁰ Original title: *The Vanishing face of Gaia*.

²¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity*.

tissues that respond to CO₂ is altered in a way that diminishes their quality as food for animals and microbes; and the efficiency in the use of water by plants and ecosystems is generally increased. The fact that increased CO₂ affects different species differently means that it is likely to bring about considerable changes in the composition and dynamics of all terrestrial ecosystems.²²

Water. Water is essential for all forms of life. Its movement due to gravity and evaporation and condensation contributes to the functioning of the Earth's biogeochemical cycles and to keeping its climate under control. Of all the water on Earth, very little is usable by human beings; most of it is either salted or frozen. Globally, humanity today uses more than half of the fresh surface water that is reasonably accessible, with 70% of that use devoted to agriculture (Figure 2).²³ To meet the growing demand on a limited supply of fresh water, mankind has extensively altered river systems through diversions and reservoirs. Only 2% of rivers in the United States are free-flowing, and by the end of this century, about two-thirds of all rivers on Earth will have their flow regulated.²⁴ At present, 6% of the flow of the Earth's rivers evaporates as a result of human manipulation.²⁵ Major rivers, including the Colorado, Nile, and Ganges, are used so heavily that very little of their water reaches the sea. Inland water bodies, including the Aral Sea and Lake Chad, have been greatly reduced in size due to the diversion of water for agriculture. The reduction in the volume of the Aral Sea had as an effect the disappearance of native fish and other losses of biota; the loss of an important fishing ground; the exposure of the bottom loaded with salts, and with it an important source of dust that is carried by the wind; the production of a drier local and continental climate as well as the general decrease in water quality in the region; and an increase in disease in humans.²⁶

The reservoirs and dams of the river flow provide water reserves that can be used to produce energy as well as for agriculture. Canals are also used for transportation,

²² Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²³ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²⁴ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

²⁵ "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

²⁶ Page 114.

for flood control and for the dilution of chemical waste. Together, all of these activities have profoundly altered Earth's freshwater ecosystems, to a greater degree than terrestrial ecosystems have been. Dam construction also indirectly affects biotic habitats; the damming of the Danube River, for example, has altered silica chemistry throughout the Black Sea. The large number of dams in operation throughout the world (36,000), together with the many that are in the pipeline, ensures that humanity will continue to have effects on aquatic biological systems.²⁷ Where surface water is scarce or overexploited, humans use groundwater aquifers—and in many areas the groundwater that is withdrawn is fossil, non-renewable water.²⁸ For example, three quarters of Saudi Arabia's current water supply comes from fossil water.²⁹

Changes in the hydrological cycle can affect the regional climate. Irrigation increases atmospheric humidity in semi-arid areas, often increasing the frequency of rainfall and storms.³⁰ On the contrary, the transformation of forested lands into agricultural fields or pastures increases the albedo[f] and reduces the surface roughness; simulations suggest that, on a regional scale, the net effect of this transformation is an increase in temperature and a decrease in precipitation.[7, 26]

Conflicts arising from global water use will be exacerbated in the years to come, with a growing human population and with the stresses that global changes will impose on water quality and availability. Of all the environmental security issues facing nations, the adequate supply of clean water will be the most important.

Nitrogen. Among the main elements required for life, nitrogen (N) is the only one whose cycle includes a vast atmospheric reserve (N_2) that must be fixed (by combining it with carbon, hydrogen or oxygen) before to be used by most organisms. The supply of fixed nitrogen controls (at least in part) the productivity, carbon storage, and species composition of many ecosystems. Before the extensive alteration of the nitrogen cycle by humans, between 90 and 130 million tons of nitrogen (TgN) per year were biologically fixed on land; fixation rates in marine systems are less certain, but may have been similar.[28]

Human activities have significantly altered the global nitrogen cycle by fixing N_2 —deliberately to produce fertilizers and inadvertently by burning fossil fuels. Industrial nitrogen fixation for fertilizers increased from less than 10 Tg/year in 1950 to 80 Tg/year in 1990; after a brief decline caused by economic turmoil in the former Soviet Union, it is expected to rise to more than 135 Tg/year by 2030.³¹ The cultivation of soybeans, alfalfa and other legumes that fix nitrogen by symbiosis increases fixation by another 40 Tg/year approximately, and the burning of fossil fuels adds more than

²⁷ “Chipmunks” in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²⁸ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁹ “Sweat lodge” in the original. *N. from trans.*

³⁰ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

³¹ “DNR” in the original. “Department of Natural Resources”. *N. from trans.*

20 Tg/year of reactive nitrogen to the atmosphere globally—part by fixing N₂ and the rest by mobilizing the nitrogen contained in the

[f] The effect known as albedo refers to the reflection of light incident on the earth's surface. Its value is the ratio between the reflected light energy and the incident light energy. *N. of the trad. fuels.* In general, human activities add to terrestrial ecosystems at least as much fixed nitrogen as all natural sources combined (Figure 2) and to this must be added an amount greater than 50 Tg/year mobilized through land conversion.[28, 30]

The alteration of the nitrogen cycle has multiple consequences. In the atmosphere, these include (i) an increasing concentration of the greenhouse gas nitrous oxide globally; (ii) notable increases in flows of nitrogen-based reactive gases (two-thirds or more of global emissions of nitric oxide and ammonia are caused by humans); and (iii) a considerable contribution to the acid rain and photochemical smog that afflict urban and agricultural areas throughout the world.³² The reactive nitrogen that is emitted into the atmosphere is dispersed by the wind, which can influence the dynamics of the receiving ecosystems. In those regions where the supply of fixed nitrogen was scarce, the added nitrogen generally increases productivity and carbon storage in ecosystems and eventually increases nitrogen and cation losses in soils, through a series of processes called “nitrogen saturation.”³³ Where added nitrogen increases the productivity of ecosystems, it also tends to reduce their biological diversity.³⁴

Nitrogen fixed by humans can also pass from crop fields, sewage systems, and nitrogen-saturated terrestrial systems to rivers and streams, aquifers, and ultimately the oceans. The flow of nitrogen through rivers and streams has been increasing markedly as human disruption of the nitrogen cycle has accelerated; nitrate in rivers is closely linked to human settlement of river basins and to the set of nitrogen inputs caused by humans in said basins.³⁵ The increase in fluvial nitrogen leads to the eutrophication of many estuaries, causing “blooms” of harmful and even toxic algae and threatening the sustainability of marine fishing grounds.[16, 34]

Other cycles. The carbon, water and nitrogen cycles are not the only ones that are altered by human activities. Human beings are also the largest source of gaseous sulfur

³² “National forests” in the original. *N. from trans.*

³³ “Buckskin” in the original. Name given especially to deer skins (“buck”) tanned without hair and with primitive techniques. *N. from trans.*

³⁴ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

³⁵ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

oxides in the atmosphere; At the regional level, these affect air quality, biogeochemistry and climate. In addition, the mining and mobilization of phosphorus and many metals exceed their natural flows; some of the metals that are concentrated and mobilized are highly toxic (for example, lead, cadmium, and mercury).³⁶ Undoubtedly humanity is a major biogeochemical force on Earth.

Synthetic organic chemical substances. Synthetic organic chemical compounds have brought many benefits to mankind. However, many are toxic to humans and other species, and some are dangerous even at concentrations as low as 1 part per billion. Many chemical compounds persist in the environment for decades; some are toxic and persistent at the same time. Long-lived organochlorine compounds offer the clearest examples of the environmental consequences of persistent substances. Insecticides such as DDT and its related substances, as well as industrial compounds such as polychlorinated biphenyls (PCBs), were widely used in North America in the 1950s and 1960s. They were transported around the globe, accumulated in organisms, and increased their concentration through food chains; they devastated the populations of some predators (especially those of hawks and eagles) and were introduced into certain aspects of the human diet in higher concentrations than would be prudent. Domestic use of these substances declined in the 1970s in the United States and Canada, and since then their concentration has decreased. However, PCBs in particular remain directly detectable in many organisms, sometimes at concentrations approaching thresholds of public health concern.[36] They will still circulate through organisms for many decades.

Synthetic chemicals do not need to be toxic to cause environmental problems. The fact that persistent and volatile chlorofluorocarbons (CFCs) were not toxic at all contributed to their widespread use as refrigerants and even aerosol propellants. The subsequent discovery that CFCs caused the decomposition of stratospheric ozone, and especially the subsequent discovery of their responsibility in the Antarctic hole in the ozone layer, turned out to be great surprises for global environmental science.³⁷ On the other hand, the response of the international political system to these discoveries constitutes the best existing example that global environmental change can be effectively confronted.[38]

Specific compounds that pose serious threats to health and the environment can and often are abandoned (despite the fact that PCB production is growing in Asia). In any case, each year the chemical industry produces more than 100 million tons of organic compounds, which represents some 70,000 different compounds, with some 1,000 new

³⁶ “Wise-use movement” in the original. The “Wise Use” movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

³⁷ “Between villages there is a death zone” in the original. *N. from t.*

compounds per year.³⁸ Only a small fraction of the many chemicals produced and released into the environment are adequately tested for health hazards or environmental impacts.

Biotic changes

The modification of the biological resources of the Earth - its species and their genetically differentiated populations - is remarkable and increasing. Extinction is a natural process, but current rates of loss of genetic variability, disappearance of populations, and extinction of species are well above background rates; it is something that is happening today; and it represents an irreversible global change. At the same time, human transport of species across the Earth is homogenizing the planet's biota, introducing numerous species into new areas where they can disrupt both natural and human systems.

Losses. Extinction rates are difficult to determine globally, in part because most species on Earth have yet to be identified. Still, recent calculations suggest that species extinction rates are now between 100 and 1,000 times higher than they were prior to human domination of the Earth.³⁹ For well-known specific groups, the rates are even higher; as many as a quarter of the Earth's bird species have been driven to extinction by human activities over the past two millennia, especially on oceanic islands (Figure 2).[42] Currently, 11% of the remaining birds, 18% of mammals, 5% of fish and 8% of plant species on Earth are threatened with extinction.⁴⁰ There has been a disproportionate loss of large mammals to hunting; these species once played a dominant role in many ecosystems and their loss has brought about a fundamental change in their dynamics[44], which could lead to even more extinctions. Larger organisms in marine systems have been similarly affected by fishing and whaling. Land conversion has itself been the most important cause of extinction, and the current rate of land conversion will eventually drive many more species to extinction, albeit with a time lag that masks the true dimensions of the crisis. [Four. Five] In addition, the effects of other elements of global environmental change—from altered carbon and nitrogen cycles and from anthropogenic climate change—are only beginning to play out.

As great as these species losses are, they do not give an idea of the true magnitude of the loss of genetic variation. The loss of locally adapted populations within species as well as genetic material within populations due to land conversion is a human-induced change that reduces the resilience[g] of species and ecosystems while it prevents the use by our species of the catalog of natural products and genetic material 46 that they represent.

³⁸ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

³⁹ 1 mile is approximately 1.6 km. *N. from t.*

⁴⁰ In this regard, see also the presentation of "There where man is a visitor" by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

Although conservation efforts focused on particular threatened species have achieved some success, they are very expensive—and the protection or restoration of entire ecosystems often represents the most effective way to maintain diversity at the genetic, population, and species levels. Furthermore, ecosystems themselves can play important roles in both natural and human-dominated landscapes. For example, mangrove ecosystems protect

[g] In ecology, resilience is the name given to the ability of a species or an ecosystem to withstand and recover from disturbances suffered. *N. of the trad.* coastal areas are eroded and provide nursery grounds for commercially important open-ocean species, but are threatened in many areas by land conversion.

Invasions. In addition to extinctions, humanity has caused a reorganization of the Earth's biotic systems by mixing species of flora and fauna that had long been geographically isolated. The magnitude of the transport of species, called “biological invasion”, is enormous⁴¹; invasive species are present almost everywhere. On many islands, more than half of the plant species are non-native, and in many mainland areas the percentage is 20% or more (Figure 2).⁴²

As with extinction, biological invasion happens naturally—and as with extinction, human activities have accelerated its rate by several orders of magnitude. Land conversion strongly interacts with biological invasion, such that human-disturbed ecosystems generally provide primary foci for invasions while in some cases land transformation itself is caused by biological invasions.⁴³ International trade is also a main cause of the disappearance of biogeographical barriers; trade in living organisms is massive and global, and many other organisms are inadvertently displaced. In freshwater systems, the combination of upstream land transformation, altered hydrology, and numerous species introductions, both deliberate and accidental, have led to particularly extensive invasion of both inland and insular ecosystems. [fifty]

In certain regions, invasions are becoming more frequent. For example, in San Francisco Bay, California, a new species has been established on average every 36 weeks since 1850, every 24 weeks since 1970, and every 12 weeks for the past decade.⁴⁴ Some of the introduced species quickly become invasive of large areas (for example, the Asiatic clam[h] in San Francisco Bay), while others become widespread only after decades or at most a century.⁴⁵

⁴¹ “Wildness” in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply “wild nature”. Here, except where otherwise noted, it has been translated as “the wild character.” *N. of t.*

⁴² *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

⁴³ “Wilderness” in the original. *N. of t.*

⁴⁴ “Breakthrough Institute” in the original. *N. of t.*

⁴⁵ “Think tank” in the original. Think tanks are usually organizations made up of multidisciplinary theorists and intellectuals who express their opinions on[https:/

Many biological invasions are practically irreversible; once a replicating genetic material is released into the environment and succeeds in it, removing it from that environment is difficult and expensive at best. In addition, certain species introductions have consequences. Some harm the health of humans and other species; after all, most infectious diseases are invasive over most of their range. Others have caused economic losses of billions of dollars; the recent invasion of North America by the zebra mussel[i] is a well-known example. Some disturb ecosystem processes, completely altering their structure and functioning. Finally, certain invasions cause losses in the biological diversity of native species and populations; after land transformation constitute the most important cause of extinction.⁴⁶

Conclusions

The global consequences of human activities are not something that we are going to have to face in the future—as Figure 2 illustrates—, they are already here. All these changes are already taking place and, in many cases, at an accelerated rate; many of them were generated long before their importance was recognized. Furthermore, all of these seemingly different phenomena point to a single cause—the increasing scale of human activities. The rates, scales, types, and combinations of changes taking place now are fundamentally different from those that have occurred at any other time in history; we are changing the Earth so fast that we don’t have time to understand this change. We live on a planet dominated by humans—and the momentum of human population growth, coupled with the pressure for further economic development in most of the world, indicates that our dominance is sure to increase. [359]⁴⁷

The texts that appear in this special section[j] summarize our knowledge about the main ecosystems dominated by humans and offer concrete policy recommendations regarding them. Furthermore, we suggest that the rate and extent of Earth disturbance caused by humans should influence how we think about Earth. It is clear that we control much of the Earth and that our activities affect the rest of it. In a very literal sense, the world is in our hands—and how we grasp it will determine its composition and dynamics, as well as our fate.

/es.wikipedia.org/wiki/Pol%c3%adtica_social][social policy,][https://es .wikipedia.org/wiki/Estrategia_pol%c3%adtica][political strategy,][https://es.wikipedia.org/wiki/Econom%c3%ada][economic]o[https://es.wikipedia. org/wiki/Militar][military,][https://es.wikipedia.org/wiki/Tecnolog%c3%ada][technology]o[https://es.wikipedia.org/wiki/Cultura][culture .]They are characterized by having some kind of ideological [https://es.wikipedia.org/wiki/Ideol%c3%b3gica][n] orientation and are often related to military laboratories, private companies and academic or research institutions. another type. His works usually have an important weight in politics and public opinion, particularly in the United States. *N. from t.*

⁴⁶ “Wilderness” in the original. *N. of t.*

⁴⁷ *Dreissena polymorpha*. *N. of the trad.*

Recognition of the global consequences of human activities suggests three complementary directions in which to act. First, we can work to reduce the rate at which we disrupt the Earth system. Humans and human-dominated systems may be able to adapt to slower change, and ecosystems and the species they support may more effectively cope with the changes we impose on them if those changes are slow. In such a case, our footprint on the planet[361] could be stabilized at a point where enough space and resources remain to support most other species on Earth, for their own good, as well as to our. Slowing the growth of human-caused effects on Earth means slowing human population growth and using resources as efficiently as practical. It is often the waste and by-products of human activities that cause global environmental change.

Second, we can accelerate our attempts to understand both the Earth's ecosystems and how they interact with the many components of human-caused global change. Ecological research is inherently complex and demanding: it requires measurements and monitoring of populations and ecosystems; experimental studies to understand the regulation of ecological processes; develop, test and validate regional and global models; and integrate with a wide range of sciences: biological, Earth, atmospheric and marine. The challenge of coming to understand a human-dominated planet further requires that the human dimensions of global change—the social, economic, cultural, and other factors that drive human activities—be included in our analyses .

Finally, human domination of the Earth means that we cannot abdicate the responsibility of managing the planet. Our activities are causing rapid, new and significant changes to the Earth's ecosystems. Maintaining populations, species, and ecosystems in the face of such changes, as well as maintaining the flow of goods and services they provide to humanity[362], will require, as far as can be foreseen, active management in the future. There is nothing that more clearly illustrates the degree of human dominance over the Earth that has been achieved than the fact that maintaining the diversity of “wild” species and the functioning of “wild” ecosystems will require increasing human intervention in them.

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Presentation of “THE BIODIVERSITY CRISIS AND THE FUTURE OF EVOLUTION”

We are used to hearing about “biodiversity” in recent times, perhaps as an extension of today’s majority values of cultural diversity within techno-industrial society or simply because it is an easily measurable and manageable value for science. It is one of the maxims of environmentalism, although greater biodiversity is not always related to a greater degree of autonomy of the wild (sometimes it even serves as an excuse to justify the profound alterations of the natural environment carried out by some human societies).

The article that we present below goes beyond the mere loss of species (loss of biodiversity) focusing attention on the serious changes that this fact, caused by the continuous development of industrial civilization, is generating in the process of the evolution of species, as well as the differences that this fact has with respect to other episodes of mass extinction that have occurred throughout the history of the planet. Myers goes on to say that technological progress is liquidating in a few decades what evolution took to generate several million years and that, furthermore, the capacity of wild Nature to generate new species is being degraded in such a way that they will have to wait (in the best of cases and as long as the conditions for it do not worsen) at least another few million years for a set of species to appear that is equivalent to the current ones in number and diversity.

This is an example of the extent to which the current degradation of the wild biosphere is a crucial issue and hardly justifiable beyond a progressive perspective (or rather blindness) with total disregard for the natural and wild world.

Beyond this, there are also critical aspects in the article from a perspective of respect for the wild, which we will try to summarize in the following points:

- Despite all the information given throughout the article, no one should be surprised at this point that the conclusions that the author draws at the end of the article are incongruous and even contradictory with the article itself. After all, he is a scientist, and as such, his scale of values is: first, to experiment and do science and then and only later, if at all, to reject the destruction of Nature and protect it. So it’s no surprise that he rejoices at the endless possibilities for experimentation offered by today’s dire ecological landscape.

- When he talks about "directing evolution along beneficial paths" he is not talking about anything substantially different from what is current, if anything worse: managing or dominating Nature (whether with good or bad intentions) is not the same as letting it evolve in peace (that is, respect the autonomy of the wild). The author does not seem to care about the autonomy of Nature.

- The feasibility of the author's previous proposal is also very doubtful, given that, in reality, the rational and conscious control and planning of complex systems and processes (such as the biosphere and evolution, in this case) are a chimera. Complex systems follow autonomous patterns and dynamics that are so complex that they are largely unpredictable and therefore uncontrollable. Unforeseen and undesired effects always arise that make that long-term and large-scale control and planning result in something very different from what the planners and managers intended to achieve.

- Moreover, there is currently another complex system with its own dynamics that is beyond human control and will: the techno-industrial system. And this will never benefit wild Nature, because it thrives precisely by degrading and dominating ecosystems to extract the necessary resources for its development and functioning. No reform of the techno-industrial society can change this (except its own collapse and disappearance).

Even so, and despite the fact that some of the biological data handled by the author are more than doubtful or simply already out of date, we believe that the article is worth publishing and reading.

THE BIODIVERSITY CRISIS AND THE FUTURE OF EVOLUTION.¹

By Norman Myers.

Introduction

Much has been written about the biodiversity crisis and how it is possible that a large part of the existing species will be lost in the near future. (For example, Western and Pearl, 1989; Raven, 1990; Erlich and Wilson, 1991; Wilson, 1992; Myers, 1993a; Pimm *et al.*, 1995). Less has been written about the potential impact this crisis may have on the future of evolution. This article proposes that certain basic processes of evolution could be seriously threatened. In particular, the author considers the possibility of a great degradation and slowdown of processes such as natural selection, speciation and biological formation². Since that is plausible, the matter deserves urgent

¹ Translation and adaptation of "The biodiversity crisis and the future of evolution", by Último Reducto. Originally published in *The Environmentalist*, no 16, 1996, pages 37-47. *N. from t.*

² "Origination" in the original. It refers to the formation of new biological forms. It has been chosen to translate it as "biological formation" on all occasions in which it appears in this text. *N. from t.*

attention, even if it still seems to generate little interest. Virtually not a single article is known to have referenced the notion that we are approaching this pivotal moment in evolution. In fact, the mere loss of species may well end up being less significant in the long run than the reduction in the ability of evolution to generate new species. This last effect could easily last - to the extent that it can be distinguished from the recovery periods that followed the mass extinction episodes (MEEs) of the prehistoric past - at least between five and ten million years and, in some senses, much longer. more time.

For the purpose of this article, an EEM is defined as an unusual reduction in biodiversity that is notable in its size and global in its extent, and that affects a wide range of taxonomic groups³ over a period of relatively short time (Jablonski, 1986; Sepkoski, 1988). Equally important, an EMS is markedly different from many of the other environmental attacks on the biosphere, such as acid rain, soil erosion, declining forests, and expanding deserts. All of these problems are inherently reversible, and can be rectified in a matter of decades or centuries. The extinction of species, on the other hand, is definitive. True, evolution will eventually end up providing replacement species. However, generating in the future a set of species equivalent to the current ones in number and diversity could require a period lasting at least 200,000 human generations (possibly more), that is, twenty times more than the time that has elapsed since the *Homo sapiens* emerged as a species.

Here is the reason for this article. As befits a matter that has so far hardly been identified, let alone analyzed and evaluated, this article is exploratory and even speculative. Far from providing the right answers, he tries to ask the right questions. Some observers might object that it is impossible to write anything scientifically valid about the future since the predictions cannot be tested. The author believes, however, that asking key questions about something that is almost entirely an unexplored subject for research is a scientifically valid exercise; and asking such questions can be an eminently disciplined process as long as the uncertainties are handled with the appropriate degree of 'precise imprecision'. The crucial factor is how to approach it: assert confidently what is known, carefully identify what is unknown, and treat everything else with an attitude of rigorous creativity.

The article begins by reviewing what is known about past EEMs and asking to what extent that knowledge is relevant to the future of evolution. He goes on to propose that, in significant respects, the future could well turn out to be radically different from anything before.

Paleontological background

³ In biology, each of the general categories into which living beings are divided and classified is called a taxonomic group or taxonomic category. A taxon is each of the concrete examples of a taxonomic category. Thus, for example, the taxon *Canis* belongs to the taxonomic category "genus" and is made up of all the animals that are scientifically known by that generic name. The *main* taxonomic categories are (from smallest to largest, always including all of the above): species, genus, family, order, class, phylum, kingdom, and domain. *N. from t.*

The forces of natural selection can act only on the available set of species and subspecies (Eldredge, 1991; Mayr, 1991; Raup, 1991, 1994; Fitch and Ayala, 1994). If this "resource base" is severely reduced, as it is likely to be at present, the result is likely to be an alteration in the creative capacities of evolution (Briggs and Crowther, 1990; Hart, 1996). It is equally likely that, judging from what we can see in the geological record, the recovery period will be unusually long.

After the crisis of the late Cretaceous⁴, 65 million years ago, it took approximately 50,000 to 100,000 years before a new set of diversified and specialized biota began to emerge. Another five to ten million years passed before multiple forms and ways of life appeared among mammals, from bats in the sky to whales in the sea (Jablonski, 1991). In the case of coral reefs, which suffered more severe damage than most other biomes, there was a hiatus of between five and ten million years before a new community of coral reef-creating species established itself (Fagerstrom, 1987; Briggs, 1991; Reaka-Kudla, 1991), while other marine biota took almost 25 million years to recover a diversity roughly similar to that of the late Cretaceous (Lipps, 1986; Hansen, 1988). After the late Permian crisis⁵, 245 million years ago, in which marine invertebrates, the most numerous category of species, lost about half of their 400 families, it took 20 million years for the survivors to establish only half the number of families they had lost, and 90 million years to rebuild 400 families (Raup and Sepkoski, 1986; Stanley, 1990; Erwin, 1993).

Furthermore, past EEMs, with the possible exception of the late Cretaceous episode, could have taken place gradually, lasting a million years or more (although this apparent prolongation of the process could be an artifact⁶ of the investigation that reflects a "diffuse" geological record in these short periods). To the extent that this gradual character is real, it would imply that many lineages may have adapted to some extent, both ecologically and evolutionarily. On the contrary, the present EEM is affecting biotas with such exceptional speed—in a single century or so, even allowing for ecological rebalancing and delayed-effect collapses—that there will be hardly any comparable opportunity for survival. ecosystem reorganization and evolutionary response.

There are other reasons why the evolutionary consequences this time might be unusually severe (Buffetaut, 1990; Myers, 1990; Adams and Woodward, 1992). There is probably a greater abundance and variety of species today than there was just before the EEMs of the past. This is due to the continuous expansion of biodiversity that has been taking place over the last 570 million years, and especially in the last 250 million years (Signor, 1990; Benton, 1993; Hochberg *et al.*, 1995; however, see Rosenzweig, 1995, for a different opinion). For example, since the end of the Cretaceous

⁴ The Cretaceous is a geological period that extended from about 145 million years ago to about 65 million years ago. *N. from t.*

⁵ A geological period that extended from about 300 million years ago to about 250 million years ago. *N. from t.*

⁶ In science, an "artifact" is any alteration in the results of an observation produced by the means used to carry it out. *N. from t.*

the number of flowering plant species may have increased from approximately 100,000 species to 235,000 (Knoll, 1986). Similarly, the number of families of all living things has doubled and vertebrate families have increased from 60 to 337 (Benton, 1995). Insects, in particular, have radiated widely (Knoll, 1986). This means that if, say, half of all species are lost this time, the total could be greater than in those past EEMs in which about half of all species were eliminated.

Furthermore, the collapse of the number of species in the present EEM will undoubtedly occur in most, if not all, of the main species categories (Erich, 1987). This is almost axiomatic if most large environments are eliminated. The result will therefore be markedly different from that of the late Cretaceous, in which many reptiles other than dinosaurs (turtles, lizards, snakes, crocodiles) survived, as well as placental mammals (heading for the adaptive mammalian radiation, eventually including to the genus *Homo*), birds, amphibians, freshwater fish, and abundant invertebrates (for example, insects, snails, and bivalves) (Clemens, 1986; Raup, 1986; Whalley, 1987; Briggs, 1991). Furthermore, it seems very likely that the present EEM will eliminate a considerable part of the terrestrial plant species (Davis *et al.*, 1986; Raven, 1990). In contrast, throughout most mass extinction events in the geologic past, land plants have survived with relatively little loss, except in the non-tropical Northern Hemisphere (Knoll, 1984; Traverse, 1990; however see also Wolfe, 1987; Johnson *et al.*, 1989). These have provided the resource base on which evolutionary processes could begin to act to maintain substitute animal species. If this botanical substrate is markedly reduced in the near future, the more the restorative capacities of evolution will be diminished.

This summary of the factors involved in past and present EEMs underscores Jablonski's (1995) key conclusion that "The most useful comparisons are likely to be based not so much on absolute extinction rates as on relative extinction intensities in taxa or regions, on the relative rates of recovery, and on the biogeographical and evolutionary behavior of taxa during intervals of past global climate change.

Overall, it appears as if the present EMS has the potential to cause impoverishing impacts on future developments that may well exceed both in scope and scale those of past EMSs. At the same time, these unprecedented impacts may even limit more "positive" and creative consequences of EEMs, such as those that have been observed in certain episodes of the past, when the elimination of a large number of species has opened the way to all kinds of of restructurings, innovations, novelties, appearances of clades⁷ and other sources and types of biological formation (Jablonski, 1991, 1995; Raup, 1991, 1994; Raup and Jablonski, 1993). Of course, these positive repercussions will eventually take place as biospheric processes and evolutionary capacities slowly recover from the present EEM and its accompanying forms of environmental degradation. But the time lag until they become significant again could be unusually long.

⁷ A clade (literally "branch" in Greek) is each one of the branches of a phylogenetic tree, that is, a set of phylogenetically related living beings (having a common ancestor). *N. del .t.*

These, then, are some “broad strokes” considerations regarding the impoverishment of the course of evolution over the next few million years.

Presentation on “MAINTAINING DISTURBANCE-DEPENDENT HABITATS”

The article that we present below deals with the importance of a type of natural processes that are usually considered by humans as “catastrophes” and/or “calamities” to be eradicated: disturbances of considerable magnitude in ecosystems not generated by humans: natural fires, earthquakes, avalanches... Specifically, the article focuses on two types of natural disturbances that have influenced the European landscape since the remote past: large herbivores and the dynamics of natural fires. And the authors make it very clear from the beginning: *“Natural disturbances (that is, those that do not derive from processes induced by human beings) are essential processes of the dynamics of ecosystems. Among the various roles that disturbances play is their contribution to the maintenance of the structure and nutrient cycles in ecosystems (...)”*. This is one of the reasons why we consider the publication of this article in Untamed Nature, because natural disturbances, regardless of how “catastrophic” they may or may not be for humans, are as much a part of Wild Nature as wild animals, wild plants, rivers, or mountains.

Other reasons are that, to a certain extent, and more or less explicitly, the authors of the text question the importance of biodiversity and some of the typical references of European environmentalists (the rural as a reference). A clear example of this is the fact that the authors recognize that agriculture was a disaster for ecosystems.

On the other hand, and as almost always, there are aspects of the article that could be criticized from a perspective of respect for the wild, such as that of Indomitable Nature.

For example, let it be said that, during the process of the development of agriculture throughout the planet, —*technological improvements allowed people to produce the same amount of food on less land, which contradicts a relationship link between population density and deforestation*”, when long-term, large-scale history has shown the opposite: historically, the ability to temporarily increase production per unit area of land provided by each technological advance It has always ended up being surpassed by the increase in demand due to the increase in population allowed by the increase in productivity itself. Technological and social development have not only gone hand in hand, but have favored and been fed back by the increase in population and this

whole process has gone hand in hand with a general decline in the forest area (and, broader, of a degradation of natural ecosystems), although some specific short-term and small-scale examples may apparently contradict this general rule.

Also, one might wonder if an ecosystem —in mosaic”, an expression that is usually used to refer above all to urbanized rural, agro-livestock or silvopastoral ecosystems, is really more biodiverse (on a large scale) than a large ecosystem little or not modified by humans. . And if so, what is the importance of this? (If it were shown, for example, that a rural environment —in mosaic” -fields, meadows, pastures, hedgerows, thickets and interspersed copses— is more biodiverse than an unfragmented forest of the same area, would it be necessary to cut down and plow part of it? the area occupied by the forest in order to increase its biodiversity?). It is about being clear about the value that one takes as a reference: either wild nature or biodiversity. In this article the authors sometimes question all this (as we have mentioned before), but sometimes they don't, so it is not clear what they really think about it.

Finally, it also seems important to us to reflect on the importance and effects of the actions that the authors propose to "restore" wild processes in certain ecosystems where human pressure has currently decreased or disappeared: *-Help local populations of wild herbivores, reintroducing them to places where they are absent, and using controlled burns may be the first steps toward restoring ecological processes*". When all this is done with the mere intention of giving an ecosystem a boost so that it recovers its dynamics and can from then on function autonomously (without management by humans), the action can be commendable and even unfortunate. , sometimes, essential for the ecosystem to recover part of its wild character. However, as we have commented on other occasions, human actions on ecosystems, whether planned "for the good of Nature" or not, do not always end up being as good as initially expected and all too often generate undesired effects that cannot be foreseen in advance. And all this even in the event that the managers of these restoration plans do so genuinely concerned with the restoration of ecosystems and not influenced by other factors such as tourism, economic benefits, job creation, etc. We draw attention to these other motivations precisely because, unfortunately in Spain at least, they tend to be too important within the conservation and restoration of ecosystems. And even on many occasions, they are a priority and capture most of the attention, effort and budgets of those who are apparently concerned about the conservation of Nature. Some examples are: the introduction of allochthonous species, painting them as autochthonous because it makes money (European bison, —tarpan", Przewalski's horses...); raising wild animals in enclosures so that tourists can easily see them, painting them as "reintroduction" and "conservation" (as is currently happening in Spain with the Iberian wolf); burn or clear ecosystems in intermediate phases of their succession because this way —the forest is cleaned, its 'healthy' development is favored", fires are avoided and jobs are created along the way; And a long etcetera.

MAINTAIN DISTURBANCE DEPENDENT HABITATS

By Laetitia M. Navarro, Vania Proenga, Jed O. Kaplan, and Henrique M. Pereira¹

Introduction

Disturbances can be defined as —specific events that alter the community or population structure of an ecosystem and change the availability of resources or the physical environment” (Turner 1998). Natural disturbances (that is, those that do not derive from human-induced processes) are essential processes of ecosystem dynamics. Among the various roles that disturbances play is their contribution to the maintenance of structure and nutrient cycles in ecosystems (Attiwill 1994; Turner 1998). More important than considering the impact of a disturbing event *per se* is considering the regime underlying the disturbances. The regime of a disturbance determines the landscape (Turner 1998), and is characterized by the frequency of the disturbance and its return interval, by its spatial extension, by its intensity (energy flux per area per unit of time) and by its severity (magnitude of the impact).

Over the millennia, humans have modified ecosystems with varying intensities and over varying spatial extents. These anthropic changes imply a modification of both the natural communities and the natural processes that cause disturbances. In particular, human activities often cause alteration of natural regimes, either directly (for example, through cattle grazing or fire suppression) or indirectly (for example, through landscape fragmentation or the introduction of invasive alien species or pests), or introduce new types of disturbance, such as pollution. Human activities can also mimic natural disturbance regimes and similarly affect biotic communities (Attiwill 1994). For example, the maintenance of traditional landscapes and the species-rich communities associated with them is implicitly linked to the continued disturbance of the ecosystem imposed by human activities.

Some have expressed concern that disturbance-dependent habitats could disappear if the human disturbance regime is altered by reducing or completely stopping human activities. Specifically, the maintenance of extensive agro-livestock systems in Europe is currently threatened due to the abandonment of the fields, which raises concern about the potential effects that changes in land use have for biodiversity (Rey Benayas *et al.* 2007). The trajectory of ecological succession after abandonment depends on several factors, but the likely shift from a moderate disturbance regime (i.e., a tra-

¹ Translation by UR of —Maintaining Disturbance-Dependent Habitats”, chapter 8 of the book *Rewilding European Landscapes*, HM Pereira, LM Navarro (eds.), Springer, 2015. © The authors, 2015. The original book can be downloaded for free at the following address: [<https://link.springer.com/book/10.1007/978-3-319-12039-3>][<https://link.springer.com/book/10.1007%2F978-3-319-12039-3>]. *Translator’s note.*

ditional mosaic landscape) to a lower or higher disturbance regime is associated with the risk of homogenization. of habitat and decline in species richness. Therefore, one of the challenges of rewilding abandoned fields is to contribute to the maintenance of disturbance-dependent habitats.

Passive regeneration after land abandonment can be a long and complex process, specific to each area. It depends on cultivation history, time since abandonment, availability of "natural" seed banks, proximity to sources of species populations, and the requirements for natural disturbances, all of which will play their part. role in the self-sustaining functioning of the restored ecosystem. When active restoration is necessary , the choice of reference point is also important (Corlett 2012) and in this sense, open ground maintained almost exclusively by (traditional) agricultural practices is a fairly recent norm. In this text, we will first describe the evolution of European landscapes through time, from the settlements of pre-modern human beings, through the progressive advent of agriculture to, finally, the recent trend towards agricultural abandonment. We will then present the two main disturbances, ie herbivory and fire, both from a natural history perspective and from a restoration approach. We will also discuss the consequences of these disturbances for the alpha and beta levels of diversity in the landscape.

An image of historical European landscapes

A debate that continues...

Describing the species, habitats, and interactions that would be present without the influence of modern humans, that is, the prehistoric reference point, is an important step in understanding natural dynamics and disturbances and guiding the restoration of self-sustaining systems (Svenning 2002; Gillson and Willis 2004; Willis and Birks 2006). However, the composition of the "pre-Neolithic landscape" (Hodder *et al.* 2009) is still the subject of active debate.

The Middle and Late Pleistocene interglacials can be used as models to describe European pre-Neolithic landscapes, due to their similar climatic conditions and reduced human activity (Svenning 2002). There are two opposing images when describing European temperate lowland landscapes: (i) the "abundant forest"² hypothesis, according to which most of Europe was covered by forests and the dynamics forests and the consequent availability of cleared land that influenced the populations of herbivores; (ii) the "forests and pastures"³ hypothesis, which describes European landscapes as a mosaic of forest areas and open country in which herbivory was the main maintainer of cleared areas. (Vera 2000; Bradshaw *et al.* 2003; Birks 2005; Mitchell 2005).

Pollen records have been used to test both hypotheses and assess the abundance, or lack thereof, of open areas in European landscapes. Normally the ratio between the

² "'High-forest' hypothesis" in original. *N. from t.*

³ —'Wood-pasture' hypothesis" in the original. *N. from t.*

percentage of tree pollen and that of non-tree pollen indicates the degree of openness of a landscape (Svenning 2002). Pollen records show that shade-intolerant species were present in both areas with evidence of large herbivores and those without such evidence, suggesting evidence in favor of the “abundant forest” hypothesis.”, in which the grazing animals are not essential for the maintenance of said species (Mitchell 2005). However, fossil records of pollen and dung beetles would support the idea that megaherbivores were the main maintainers of open areas, at least in the floodplains of northwestern Europe (Svenning 2002), as a diverse community of dung-dependent beetles may be linked to the presence of large populations of herbivores (Sandom *et al.* 2014).

However, three other types of natural processes can also explain the presence of open areas: forest fires, tree felling due to wind, and edaphic-topographic conditions (Svenning 2002; Fyfe 2007; Molinari *et al.* 2013). *The most likely explanation is that habitat distribution was originally based on physical factors (Bradshaw et al. 2003), and was later reinforced and/or maintained by large herbivores, which with the impact of their browsing and grazing would delay secondary successions.*

Temporal evolution of the European landscape

The first hominids arrived in Europe from Africa in the Early Pleistocene, around 1.2-1.1 million years ago (Carbonell *et al.* 2008), while modern humans colonized the continent between the 46,000 BP and 41,000 BP (Mellars 2006). The appropriation of new lands coincided with changes in the European landscape. Nomadic hunter-gatherers began to actively manage their ecosystem through the use of fire in the Pleistocene: what began as a household tool (eg for cooking, warmth, and protection from predators) also became useful for direct prey to hunting grounds, to clear transit routes and to clear spaces for herbivores (Daniau *et al.* 2010; Kaplan *et al.* 2010; Pfeiffer *et al.* 2013).

The development of agriculture was the next step in the appropriation and management of the environment by human beings (Pereira *et al.* 2012). The spread of agriculture from the northern Levant and northern Mesopotamian area to Europe is estimated to have begun between 11,550 BP and 9,000 BP and spread at a rate of 0.6 to 1.3 km/year, with that agriculture reached northwestern Europe within 3,000 years (Pinhasi *et al.* 2005; Ruddiman 2013). This spread of agriculture caused the human population to increase fivefold (Gignoux *et al.* 2011), which had important consequences on the landscape. Several models have been designed to investigate the historical evolution of this human impact. The models, which do not assume a direct linear link between human density and deforestation but also consider other factors, such as technological change, show that the rate of land grabbing was much higher in the remote past than in the recent one. (Ruddiman 2013; Kaplan *et al.* 2010). To begin with, as time passed and deforestation occurred, there was less and less forest left to clear. More importantly, technological improvements have allowed people to produce

the same amount of food on less land, contradicting a direct relationship between population density and deforestation (Ruddiman 2013). Based on these nonlinear concepts, Kaplan *et al.* (2010) presented model scenarios of Holocene anthropogenic land cover change. By 8000 BP, only Mesopotamia and Turkey showed signs of human land use, but by the early Iron Age, by 3000 BP, as much as 40% of European land may have been cleared for extensive agriculture. and as grasses (Fig. 1). Between 8,000 BP and 3,000 BP, Kaplan *et al.* (2010) suggest that land use in Western Europe ranged from 5.5 to 6.5 ha per capita and was relatively stable. By 2500 BP, growing populations in most of Western Europe led to an intensification of land use (Fig. 1) and a decline in per capita values. Later, population declines would result in major episodes of land abandonment, during the Great Migration Period following the fall of the Western Roman Empire and after the Black Death Epidemic of 1350 AD. By 1850 AD, at the end of pre-industrial times, most European landscapes usable for intensive cultivation or grazing had been deforested and land use fell to values close to 0.5.

The role of natural disturbances

Researching the history of natural disturbances can provide researchers and managers with information on restoration guidelines (Donlan *et al.* 2006). We have identified two types of disturbances that were critical to the maintenance of European landscapes before human land-grabbing occurred: large herbivores and wildfire dynamics.

Pre-Neolithic Ecosystem Engineers

Ecosystem engineers are organisms that create and/or maintain habitats, either directly or indirectly (Jones *et al.* 1994; Wright and Jones 2006), and thereby create niches for other species. The act of grazing and browsing is not enough to be considered engineering (Wright and Jones 2006). However, the consequences of herbivory, trampling, and fertilization, especially by large herds of megafauna, have a direct impact on habitat distribution (Vera 2000; Birks 2005). Small mammals are also known to have a significant impact on vegetation, for example by disturbing the soil and modifying its physical and chemical properties (Jones *et al.* 1994), but this is more beyond the object of this text.

During the interglacial cycles of the late Quaternary, and before the mass extinctions, Europe's landscapes were characterized by abundant megafauna (Bradshaw *et al.* 2003). The available fossil evidence can attest to the presence of species in a given region while, using the impact of similar species existing today as a model, we can obtain information about the role that extinct megaherbivores played in the landscape (Corlett 2012). However, unlike pollen, there are not enough fossil records of large pre-Neolithic herbivores to allow estimation of their past densities (Bradshaw *et al.* 2003; Mitchell 2005) and we still lack precise knowledge about their behavior (Hodder *et al.* 2009).

The megafauna of Europe at the end of the Pleistocene (Table 1) was similar to that found in savannahs today, with herbivores such as proboscideans and rhinoceroses and large carnivores such as hyaenids and felids (Blondel and Aronson 1999). ; Vera 2000; Bradshaw *et al.* 2003). At a global level, the group of large herbivores suffered more prehistoric extinctions than other taxa (Johnson 2009). Cyclical climate change would normally have been responsible for regular faunal change and would later combine with increased human pressure (Corlett 2012; Morrison *et al.* 2007) causing several of these megafaunal species to become extinct. at the regional (eg hippopotamus), global (eg woolly mammoth), and often functional (Blondel and Aronson 1999; Bradshaw *et al.* 2003) levels. Some species also suffered large contractions in their distribution, such as moose (Morrison *et al.* 2007). In addition, humans domesticated animals in the Fertile Crescent about 10,000 years ago (Zeder 2008; Pereira *et al.* 2012) and migrated west as herders, increasing the grazing area in Europe and replacing wild herbivores by domestic species. Since 1 AD, most of Europe's open countryside has been under human land use (Fig. 1).

Large herbivores, both extinct and extant, can be classified according to their feeding behavior (Vera 2000; Svenning 2002; Bullock 2009): browsers⁴ (eg, moose, straight-tusked elephant) tend to go associated with areas with abundant trees; the grazers⁵ (eg, hippopotamuses, aurochs), on the contrary, are associated with the presence of habitats with abundant pastures; Lastly, there would be those that have a mixed diet (eg, red deer, wild goats) that alternate between browsing and grazing (Table 1). For example, mixed-feeding European bison have historically been associated with both closed forest and semi-open habitats (Kuemmerle *et al.* 2012). The social structure of herbivores (ie, solitary, in groups, or in herds), also provides information about the pressure that browsing and grazing exert on the landscape (Table 1).

As a result, one of the most direct impacts of large herbivores on the landscape is the limitation and variation in the spatial distribution of secondary successions (Laskurain *et al.* 2013; Kuiters and Slim 2003). However, the role of herbivores goes beyond the direct impacts of browsing and grazing. For example, elephants are known to create large physical disturbances by trampling trees and bushes (Jones *et al.* 1994), which changes their habitat, the amount of fuel, and the local fire regime and this, in turn, benefits plant species that require light. Disturbance induced by the rooting behavior of wild boar favors natural forest regeneration, although it is considered harmful to pastures (Schley *et al.* 2008; Sandom *et al.* 2013a) . Large herbivores play a role as seed dispersers through the consumption of large amounts of forage: the little oral processing of the fruits contained in the forage allows the dispersion of undamaged seeds in the feces (Corlett 2012; Johnson 2009). . Some seeds even need to pass through a digestive

⁴ "Browsers" in the original. In reference to animals that mainly feed on the leaves and branches of woody vegetation. *N. from t.*

⁵ "Grazers" in the original. In reference to animals that mainly feed on grass (grasses). *N. from t.*

tract to trigger germination. Finally, the manure of herbivores is important for nutrient cycling and soil fertilization (Zimov 2005).

Fire dynamics

Fire is a critical component in the functioning of many ecosystems. It maintains and shapes vegetation structure and biotic communities, promotes natural regeneration and habitat diversity, takes part in biogeochemical cycles, and can influence soil properties and water functions (Thonicke *et al.* 2001; Bond and Keeley 2005). Unlike herbivory, fires consume both dead and living material and do not discriminate between edible and non-edible plants (Bond and Keeley 2005), and may act as selective pressures on fire resistant traits (Pausas and Bradstock 2007; Pausas *et al.* 2006).

Open pasture land Extensive land use Intensive land use

Table 1 List of species of large herbivores, both extant and now extinct, that were present in Europe in the late Pleistocene or sometime between the early Holocene and the present. (Blondel and Aronson 1999; Bradshaw *et al.* 2003; Bullock 2009; Smith *et al.* 2003; Svenning 2002; Vera 2000). IUCN status: *LC* Least Concern, *VU* Vulnerable, *CR* Critically Endangered. Feeding behavior: *M* mixed feeding, *G* grazers, *B* browsers. Social structure: *G* groups, *H* herds, *S* solitary.

Species | Existing in
Holocene | Extinct | Extinct in Europe | Locally extinct | European Status
according to the IUCN | Eating behavior | Social structure |

<i>Alces alces</i> (Eurasian Moose)	X			X	LC	B	S

<i>Bison bonasus</i> (Euro-pean bison)	X			X	VU	M	H

<i>Bison priscus</i> (Steppe bison)	

X | | |
G | |

Bison schoetensacki | |
X | | | |
G | |
Bos primigenius (Aurochs) | X | X | | | |
G | H |

<i>Bubalus murrensis</i> (Murr’s water buffalo)	

X | | | |
M | |

X | | | |
VU | M | H |

<i>Capra ibex</i> (Alpine ibex)	X			X	LC	M	G

<i>Capra pyrenaica</i> [a] (Iberian ibex)	X	

X[a] | X | LC/VU | M | G |

<i>Capreolus capreolus</i> (Roe deer)	X			

LC | B | S |

<i>Capreolus suessenbornensis</i>	

X | | | |
M | |

<i>Cervus elaphus</i> (Red Deer)	X			X	LC	G	G	[a] There are four sub-species of <i>Capra pyrenaica</i> , two of which are extinct— <i>C. pyrenaica lusitanica</i> and <i>C. pyrenaica pyrenaica</i> —while the other two still exist— <i>C. pyrenaica victoriae</i> and <i>C. pyrenaica hispanica</i> .

Table 1 (continued)
Species | **Existing in the Holocene** | **Extinct** | **Extinct in**
Europe | **Locally extinct** | **European status according to IUCN** | **Eating**
behavior | **Social structure** |

<i>Coelodonta antiquitatis</i>

(Woolly Rhinoceros) | |
X | | | |
B | |
Clactonian Lady | |
X | | | |
M | |
Lady lady (Fallow deer) | X | | | |
LC | M | H |

<i>Dicerorhinus hemitoechus</i>

(Narrow-nosed Rhinoceros) | |
X | | | |
B | |
Equus ferus (Tarpan) | X | X | | | |
G | H |

<i>Equus ger-</i> <i>manicus</i> (Forest horse)	X	X			

G | |
Equus hydruntinus (European Ass) | X | X | | | |
G | |
Equus przewalskii (Przewalski’s Horse) | X | |
X | | | G | G |

<i>Hipparion crassum</i>	

X | | | |
B | |
Hippopotamus amphibius

(Hippopotamus) | X | |
X | | | G | G/S |

<i>Hippopotamus antiquus</i>

(European hippopotamus) | |
X | | | |
M | |
Mammuthus primigenius (Woolly Mammoth) | X | X | | | |
G | G |

<i>Megaloceros cazioti</i>	

X | | | |
M | |
Megaloceros dawkinsi (Giant Deer) | |
X | | | |
M | |
Megaloceros euryceros | |
X | | | |
M | |

Table 1 (continued)

Species | Existing in

**Holocene | Extinct | Extinct in Europe | Locally extinct | European Status
according to the IUCN | Eating behavior | Social structure |**

<i>Megaloceros giganteus</i> (Giant Irish Elk)	X	X				

M | |
Ovibos moschatus (Musk Ox) | X | | | X | LC | M | H |

<i>Ovis aries orientalis</i> (Mouflon)	X			X	VU	M	G

<i>Paleoloxodon antiquus</i> (Straight-tusked Elephant)	

X | | | |
M | G |

<i>Pseudodama nestii</i>	

X | | | |
M | |

Rangifer tarandus (Reindeer) | X | | | X | LC | M | H |

<i>Rupicapra pyrenaica</i> (Pyrenean chamois)	X			X	LC	M	G

<i>Rupicapra rupicapra</i> (chamois)	X			X	LC	M	H

<i>Saiga tatarica</i> (Saiga)	X	

X | |
CR | M | H |

<i>Soergelia elisabethae</i>	

X | | | |
M | |

Stephanorhinus kirckbergensis
(Merck's Rhinoceros) | |

X | | | |
B | |

Sus scrofa (wild boar) | X | | | X | LC | M | G |

<i>Ursus spelaeus</i> (Cave bear)[b]	

X | | |

M | S | [b] Cave bears had a predominantly herbivorous diet.

Fire-dependent systems cover approximately 53% of the global land surface (Shlisky *et al.* 2007). These systems (eg, Mediterranean forests and boreal forests) evolved in the presence of fire and depend on this disturbance to maintain their structure and composition, with fire regimes characterized by their frequency, intensity, and seasonality and specific to each ecosystem. In addition, 22% of the world's land surface is covered by fire-sensitive ecosystems, in which fire plays a secondary role in maintaining its structure and composition (eg, broadleaf forests and mixed forests of Alps), 15% is covered by fire-independent ecosystems, where fire is not an evolutionary force due to scarcity of fuel or ignition sources (eg tundra) and the remaining 10% is not yet classified (Shlisky *et al.* 2007).

In Europe, natural fire regimes are mainly of two types: (i) intense and large and (ii) cool and small (Archibald *et al.* 2013). The first type is typical of Mediterranean and boreal ecosystems, in which large crown fires of high intensity are repeated at intervals that can extend from a decade, in some specific Mediterranean areas, to more than a century (Archibald *et al.* 2013). The second type occurs interspersed with the first, in the same biomes, and is associated with surface fires that burn fuels scattered on the ground (Archibald *et al.* 2013). However, due to a long history of human presence, many ecosystems in Europe, including fire-sensitive systems, have altered fire regimes as a result of changes in land use and human fire management (Shlisky *et al.* 2007; Archibald *et al.* 2013; Molinari *et al.* 2013). Currently, the annual frequency of fires in Europe ranges from less than five per NUTS3⁶ to almost a hundred in some areas of the Mediterranean region, which also has the largest average area burned annually, with more than 10,000 ha/year in some NUTS (European Commission 2010). In Europe, four types of area can be identified based on their fire regimes, combining both the fire frequencies and the average area burned in each NUTS3 (Fig. 2). Central France, northeastern Germany and most of Romania have small fire regimes, with few fires (<20 per year) and little area burned (<35 ha). Poland and most of the Baltic and Scandinavian countries are areas with relatively high fire frequencies (>50 per year) but little area burned (<35 ha). In contrast, most of Bulgaria and Greece are regions where a small number of fires (<20 per year) is sufficient to burn large areas (>115 ha). Lastly, southern Italy, Croatia and the Iberian Peninsula are areas with a high frequency of fires (>50 per year) and large areas burned (>115 ha).

Fire suppression is a common land management policy that is carried out to protect human communities and land (Shlisky *et al.* 2007; Fernandes 2013) but also promotes the accumulation of fuel in fire-dependent systems and increases the risk of large and

⁶ Third level of the Nomenclature of Territorial Units for the Statistics of the European Union. Authors note.

intense fires (Proenga *et al.* 2010; Fernandes 2013). On the other hand, fire has also been widely used as a tool to lighten landscapes and reduce fire risk. In Europe, man-made fires are often more frequent than natural fires. High-frequency fire regimes can cause species community depletion, by excluding fire-sensitive species and promoting fire-resilient species that withstand frequent fires, and can also cause extensive land degradation, and nutrient loss (Thonicke *et al.* 2001). This is especially true in Mediterranean ecosystems, where 93% of fire regimes are considered to be in a degraded or highly degraded state (Shlisky *et al.* 2007).

Currently, the abandonment of arable land is also causing other changes in fire regimes across Europe, especially in southern Europe, with potential impacts on diversity and ecosystem services (Mouillot *et al.* 2005; Bassi *et al.* 2008; Proenga and Pereira 2010). Where the number of ignitions is not a limiting factor, which is true in many regions subject to the abandonment of arable land (Bassi *et al.* 2008; Ganteaume *et al.* 2013), *climate and fuel availability will be the main determinants of future changes in the fire regime. In high-productivity ecosystems with high moisture content, such as temperate broadleaf forests, fires will be climate and moisture-limited and less sensitive to changes in fuel accumulation, even though fuel remains being a limiting factor (Pausas and Ribeiro 2013). Vegetation will be more susceptible to fire during warmer times after droughts, when the existing fuel is more flammable (Proenga et al. 2010; Pausas and Ribeiro 2013). In low-productivity ecosystems, such as Mediterranean scrub areas, fuel is the main limiting factor and will be the main cause of changes in the fire regime (Pausas and Fernández-Muñoz 2012; Pausas and Ribeiro 2013). The most recent trends in the western Mediterranean basin support the previous predictions (Pausas and Fernández-Muñoz 2012). In this region, fields used to be grazed, frequently burned (on a small scale), and cleared for cultivation and wood extraction (Proenga and Pereira 2010), limiting the availability of fuels. The rural exodus from the mid-20th century led to the expansion of bushland and the planting of fire-prone forest species, leading to larger, more frequent and more intense fires. Today, higher fuel loads and greater spatial continuity are causing a change in the fire regime, which is becoming more sensitive to drought, similar to what occurs in highly productive ecosystems (Pausas and Fernández-Muñoz 2012). In the future, the response of the fire regime to changes in climatic variables, such as precipitation, is expected to be non-linear (Batllori et al. 2013): while a small decrease in annual rainfall can increase the probability of fires, a large decrease can cause the opposite response, due to a drop in the productivity of ecosystems, causing the system to return to a fire regime limited by fuels.*

Disturbances and diversity

Traditional landscapes in Europe, especially High Nature Value (HNV) farming areas, are recognized for their high species richness and high conservation value (Blondel and Aronson 1999; MacDonald *et al.* 2000; EEA 2004). Patterns of species diversity in traditional landscapes are likely to be different from those that would be found in unmodified (primary) landscapes (Blondel and Aronson 1999). When the total number

of species is taken into account, higher species richness at the habitat patch scale (i.e., α -diversity) is expected in traditional landscapes because species are able to use more than one habitat. habitat and due to the high density of habitat edges, which facilitates movements between plots and, consequently, leads to a greater change of species in space and time (Proenga and Pereira 2013; Guilherme and Pereira 2013). Note that even with movements between plots, each habitat type will maintain a distinctive species community due to differences in species abundance and due to the existence of strict specialists specific to each habitat. As a result, in the case of specialist species, a diversity is likely to be lower in traditional mosaics due to the effect of habitat fragmentation and their low tolerance to conditions found in other habitats (Proenga and Pereira 2013). For example, the diversity of forest species is lower in patches of fragmented forest than in an area of similar size in continuous habitat (Proenga 2009). In terms of species movement (ie, β diversity), traditional landscapes may have a higher rate of species change than original undisturbed lands (Blondel and Aronson 1999), due to their mosaic structure. However, the validity of this assumption depends on the scale of the analysis. For example, replication of the traditional habitat mosaic over large spatial scales is expected to result in greater similarity of (modified) habitats, promoting the presence of similar communities over large areas. Finally, the effect of these changes on the total number of species found in the landscape (ie, γ diversity) is less clear. In fact, while several species suffered declines or even extinctions due to the destruction or modification of habitats (eg bears and aurochs), other species benefited from these changes and proliferated in habitats modified by humans (eg. : birds that inhabit arable fields). Furthermore, farmers and ranchers have been introducing new species into European ecosystems since the early Neolithic (Blondel and Aronson 1999). And they have also been doing the same unintentionally through the dispersal of species by animal herds along transhumance routes (eg Poschlod *et al.* 1998). These two activities, therefore, increased the regional stock of species, although globally its richness declined due to extinctions.

Diversity and intermediate disturbances

The intermediate disturbance hypothesis (Connell 1978) and the diversity-disturbance hypothesis (Huston 1979) are often used to explain the ecological mechanisms that determine the high species diversity found in traditional landscapes (e.g., Blondel 2006): peaks in species diversity when communities are exposed to moderate disturbance, in terms of frequency, extent, and intensity. This occurs because moderate disturbance (eg, moderate pace) creates discontinuities in the ecosystem that allow the maintenance of species typical of early stages of succession while preventing the dominance of more competitive species, thus maintaining the ecosystem in a midway between the early communities and those of the stable state. The management of traditional landscape mosaics (Fig. 3), with low-intensity

agriculture, moderate pacing and the maintenance of patches of forest, is often described as an example of intermediate disturbance and thus as promoting species diversity (Ostermann 1998; Henle *et al.* 2008). However, cases in which there is a direct relationship between species richness and disturbance are not the norm in ecological studies (Mackey and Currie 2001). Curve maxima are more frequent in studies covering small spatial scales and in the presence of natural perturbation regimes (Mackey and Currie 2001). In addition, the relationship between taxa richness and the intensity of human disturbance regimes is often negligible (Mackey and Currie 2001), increasing the difficulty of predicting the biodiversity impacts of altered disturbance regimes.

Effects of land use change on disturbance regimes

Changes in land use caused by rural abandonment can create the conditions for an increase in the frequency and intensity of particular disturbance events, in particular increased fire risk due to fuel accumulation and bushland expansion. , but can also result in fewer disturbances if disturbance agents, such as domestic herbivores, become residual or even disappear. The trajectory of secondary successions after abandonment depends on several interacting ecological factors and filters, such as the assemblage of colonizing species in the surrounding landscape, their ability to colonize abandoned plots, soil quality and, of course, the disturbance regime (Cramer 2007). Disturbances will not only exert selective pressure on the community as a whole, but will also respond to the structure and composition of the community.

In landscapes where the density of trees is very low, as is the case in some Mediterranean landscapes, there is a high probability of expansion of the scrub after the abandonment of arable land due to the scarcity of seeds, predatory pressure on acorns and poor abiotic conditions, such as poor soils (Acácio *et al.* 2007). Forest fires will also promote the predominance of thickets, due to the ability of many bushes to sprout from the roots. Therefore, forest fires can establish a feedback loop that causes reinforcement, leading to community homogenization and a decline in diversity at all scales (Proenga and Pereira 2010).

A different trajectory can be expected in landscapes with a high tree density, such as the semi-natural rangelands of Northern Europe (Eriksson *et al.* 2002). There, the availability and dispersal of seeds are not limiting factors and the forest is capable of colonizing and regenerating them in a relatively short time. With a disturbance regime that can be expected to be low, forests may expand, which would cause habitat heterogeneity to decline. Some species, such as grassland specialists, will show sharp declines in abundance or even become locally extinct. Impacts at the landscape level will depend on the ability of species to persist in alternative habitats such as forest edges or heaths (Proenga and Pereira 2013).

The above examples describe abandoned parcels in a fairly homogeneous landscape matrix with either low or high tree density. In a heterogeneous landscape with a more balanced coverage, made up of different habitats and diverse edaphic-topographic conditions, the scenarios could be different given the diversity of local responses to changes in the disturbance regime. Habitat diversity would not only counteract landscape homogenization, but would provide alternative habitats for species affected by arable land abandonment, thereby reducing the impact on species diversity due to land use change. The persistence of these species in the landscape will then depend on these alternative habitats being maintained, either through natural processes, such as the herbivory of wild ungulates, or through assisted processes, such as controlled burning or the reintroduction of herbivores. Both approaches to restoration, either passive or assisted, are an important outstanding question in rewilding research.

Maintain habitats that depend on disturbance

Wild herbivores: natural (re)colonization or (re)introduction?

Today, only 16% of the Palearctic region, including Europe, contains areas occupied by undisturbed large mammal faunas, that is, species that have not undergone major changes in their distribution between AD 1500 and the present (Morrison *et al.* 2007). This figure does not even consider the number of species that became extinct at the beginning of the Holocene (Table 1). There are also clear regional differences if one looks at the current species richness of large herbivores in Europe (Fig. 4): Central European countries have the highest diversity, while more western countries have low species richness. Species-rich areas, with lower human densities and less pressure on the land, could become “sources” for natural recolonization. This has already been documented for some species of large herbivores whose populations have been showing substantial increases since the 1960s (Table 2). Although legislation and measures aimed at conservation have greatly contributed to this (Deinet *et al.* 2013), rural depopulation and the consequent reduction in human pressure, both direct (eg: less hunting) and indirect (eg, more available land), can also explain the phenomenon (Table 2). Wild populations may also benefit from the absence of competing and predatory species (Bradshaw *et al.* 2003), although unregulated population growth could become a problem (eg if their pressure on earth is too intense).

In those cases where the local richness of wild herbivores is low, such as in Western European countries (Fig. 4), species can be introduced to restore ecosystem functioning (Sandom *et al.* 2013b).

That is, assuming that its functional role has been neglected (Lipsey and Child 2007) and that the abandoned land meets its natural resource requirements. A study of wild boar populations confined within fences showed that their rooting behavior can create germination niches (Sandom *et al.* 2013a) and contribute to forest regeneration. However, they can also be detrimental to established trees by stripping their bark or uprooting them (Sandom *et al.* 2013b). Reintroducing ecological engineers to restore and/or maintain disturbance-dependent habitats may also be more time- and cost-efficient than human-driven restoration (Byers *et al.* 2006; Sandom *et al.* 2013a). In

addition, since reintroduced species have charismatic values, their presence could facilitate the acceptance of some rewilding projects by the public (Lipseý and Child 2007; Kuemmerle *et al.* 2012). The reintroduction of wild herbivores can also be considered positive from an ecosystem services perspective, based on the value of the existence of megafauna (Proenga *etal.* 2008) and associated with cultural services (eg. : tourism, hunting).

However, a balance must be struck when considering the (re)introduction of herbivores and the many potential difficulties should be raised and discussed (Seddon *et al.* 2007; Corlett 2012; IUCN 2013). First, which species should be reintroduced? When taxa need to be substituted for ecological replacements (IUCN 2013), researchers' opinions are divided, ranging from the release of domesticated animal breeds to the reintroduction of existing species related to long-lost species (eg Donlan *et al.* 2006). The release of animals also raises the issue of increased risk of conflict between local human populations and "wildlife" (eg Enserink and Vogel 2006; Goulding and Roper 2002), which might be more readily accepted if species progressively and naturally recolonizing the area. For reintroduced domestic species (eg horses), there is also no legal framework regarding the responsibility of the organization that carries out the reintroduction, for example for those cases in which damage or accidents occur. Finally, an overabundance of certain species can have negative effects, especially when the set of natural predators is absent and cannot regulate populations, however, no specific guidelines have been designed for the natural control of reintroduced populations (IUCN 2013). For example, in the Scottish Highlands, where large carnivores have been extinct for centuries, large populations of browsers are now limiting natural forest regeneration (Sandom *et al.* 2013b).

Controlled burns

Fire can be used as a tool in landscape management for two main purposes: to control the risk of combustion and the intensity of forest fires, and to manage the structure and biodiversity of the landscape. Controlled burns are often used as a preventative measure to control fuel load and fire intensity (eg Fernandes 2013). Furthermore, the combination of different fire regimes can be used to maintain heterogeneity of landscapes and habitats for species that depend on different stages of ecosystem succession (Driscoll *et al.* 2010). In regions where fire risk and scrub expansion are equal threats to biodiversity conservation, fire can be used as a tool to address both problems (Moreira and Russo 2007).

However, the use of controlled burning can also pose some conservation problems. For example, prescribed burns are carried out during the wet season (between winter and spring) when there is little risk of fire spread, while natural fires occur on dry days, especially during the summer. This divergence in fire seasonality can negatively impact not only spring-breeding species (van Andel and Aronson 2012), such as ground-nesting

birds, but also the persistence of plant species, for example by causing premature seed release or destroying annual plant shoots before they create a seed bank (Whelan 1995; Bowman *et al.* 2013). Another problem is the repercussions of controlled burning for the mitigation of climate change. Large-scale controlled burning can exacerbate climate change, due to the emission of greenhouse gases and aerosol particles (Russell-Smith *et al.* 2009; Fernandes *et al.* 2013). *Although more research is needed to understand the effects of prescribed burns on the carbon cycle (Fernandes 2013), it is also generally accepted that well-planned prescribed burns prevent further carbon loss to the atmosphere by reducing wildfire risk (Bowman et al. 2013; Fernandes 2013). Finally, defining the prescribed burn regime can be difficult (Whelan 1995; van Andel and Aronson 2012). Replicating natural fire regimes may not be possible due to lack of historical information. It may not even be recommended, given changes in landscape structure and, in some areas, local climate, which may result in unforeseen responses to fire (Driscoll et al. 2010). Therefore, controlled burns should be planned to achieve the desired results rather than attempting to mimic the parameters of natural fire regimes (Whelan 1995). Specifically, in the context of rewilding, fire dynamics should only be managed, or "assisted" in the early stages after abandonment, to facilitate the restoration of natural fire regimes.*

Conclusions

Millennia of human activities have progressively replaced natural disturbances, such as herbivory and fire, in shaping Europe's landscapes. Maintaining habitats that are dependent on disturbance after the removal of these human activities is a difficult restoration process. It may be guided by knowledge of the past (Vera 2000; Gillson and Willis 2004; Willis and Birks 2006; Sandom *et al.* 2013b) and our improved ability to understand the dynamics of ecosystems and to project possible paths of restoration. This means identifying the most desirable outcome in terms of both biodiversity and resilience. However, in addition to human impacts on landscapes, other biotic and abiotic alterations have given rise to the current composition of ecosystems. The climate has changed over the last millennium and some species have become extinct while others have invaded new areas, all of these changes influencing ecological processes (Gillson and Willis 2004; Hodder *et al.* 2009). The interaction of human pressure with natural changes (eg, non-anthropogenic climate changes) could also have caused tipping points to be exceeded (Gillson and Willis 2004; Kaplan *et al.* 2010; Leadley *et al.* 2014). Therefore, returning landscapes to their historical conditions would be unattainable, even if it were desirable. This means that reference points must change, not only for politicians and the public who are attributing cultural values to a relatively recent landscape (Vera 2009), but also for scientists and conservationists, some of whom, on the contrary, they have a memory of the European landscape that goes back too far.

An additional concern appears with the abandonment of arable land when herbivores also become functionally extinct, as a consequence of a reduction in agricultural activities (Donlan *et al.* 2006), while the regime of fireworks is altered. Hence, in the early stages after field abandonment, “restoration goals” should be defined to determine the set of biotic and abiotic factors that could be managed (Byers *et al.* 2006). Helping local populations of wild herbivores, reintroducing them where they are absent, and using controlled burns can be the first steps towards restoring ecological processes.

For example, the choice between natural recolonizations, reinforcement of local populations, or reintroductions will depend on the current distribution and abundance of herbivore communities. In parts of central Europe, herbivore diversity might be expected to be high enough to allow recolonizations, while in western and southern Europe, active introduction might be necessary (Fig. 4). In all cases, the establishment of viable populations will require conservation measures, legislation and the reduction of human presence (Table 2).

When rewilding is aimed at ecological restoration, reintroductions should be one of the tools to use rather than a goal *per se*. Also, the historical references should be taken as guidelines, not as targets. In other words, instead of focusing on the conservation of a given set of species or habitats, rewilding should focus on the restoration and conservation of natural processes, with human intervention reduced to a minimum.

Table 2 Population trends of the large herbivores of Europe and main reasons for the recovery of the populations. (Based on Deinet *et al.* 2013).

Species | Population estimates (year)[a] | Population increase (1960-2005) (%) | Importance of the causes of the increaseb | Has it been observed
natural recolonization? |

Legislation	Measures aimed at conservation (including

reintroductions) | Reduction of human pressure (ex: land abandonment, descent on the hunt) | Change in

environmental conditions

<i>Alces alces</i> (Moose)	719,810 (2004/ 2005)	210	3	1	2	4	X

<i>Bison bonasus</i>

(European bison) | 2,759 (2011) | + 3,000 | |

1 | |

2 | |

36,780 (2004/2005) | 475 | 1 | 2 | |

3 | |

Pyrenean Capra

(Iberian ibex) | >50,000 (2002) | 875 | 2 | 1 | 3 | |

<i>Capreolus capreolus</i> (Roe deer)	9,860,049

(2005) | 240 | 3 | 2 | 1 | 4 | X |

<i>Castor fiber</i>

(Beaver) | >337,539 (2003-2012) | >14,000 | 1 | 2 | 3 | |

X |

<i>Cervus elaphus</i>

(red deer) | 2,443,035 (2002-2010) | 400 | 2 | 1 | 3 | 4 | X | [a] Some population estimates have been obtained by adding values from national studies carried out in different years, hence in some cases a time interval is given instead of a study year.

b Classification based on Deinet *et al.* (2013), in which “1” is the most relevant and —4” the least relevant. The number of observed causes of increase varies by species.

Table 2 (continued)

Species | Population estimates (year)[a] | Population increase (1960-2005) (%) | Importance of the causes of the increaseb | Has it been observed natural recolonization? |

Legislation	Measures aimed at conservation (including

reintroductions) | Reduction of human pressure (ex: land abandonment, descent on the hunt) | Change in

environmental conditions

<i>Rupicapra pyrenaica</i> (Pyrenean chamois)	69,100 (2008)	550	1	2	3		

<i>Rupicapra rupicapra</i> (Chamois)	485,580 (2004/2005)	85	4	1	2	3	

Sus scrofa (wild boar) | 3,994,133 (2004-2012) | 400 | |
1 | 3 | 2 | |

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Presentation of “THE LAST BORDERS OF THE WILDLANDS”

The following article has as a peculiarity the fact that it takes as a parameter of scientific study the wild nature of ecosystems (“intactness”, in the authors’ vocabulary). It seems that some scientists are realizing that things like biodiversity or ecosystem services are not enough by themselves to assess the state of Nature, much less to try to protect it. At best, these secondary parameters are only specific effects of a main feature much less taken into consideration by scientific studies until recently: the wild nature of ecosystems; its degree of non-modification and influence by human beings. Now all that remains is for these scientists,

(1) Recognize that the wildness of ecosystems is an important feature in itself, apart from being useful in evaluating and promoting ecosystem services such as global warming mitigation or biodiversity conservation.

(2) Recognize the ultimate cause of the problem of the gradual disappearance of — intact” (read wild) landscapes, which is none other than the existence and development of civilization in general and of techno-industrial society in particular.

But they will probably take a long time to do it. If it ever happens.

More specifically, the article is a good source of data on the state and evolution of large wild forest ecosystems in the first two decades of the 21st century.

However, it should be noted that as much as the authors insist that legal protection has largely helped to prevent the reduction of the area of forest landscapes —intact”, in reality, the article shows that this has not been the case in all cases (eg in Australia, Madagascar or the Democratic Republic of the Congo) and that legal protection does not really prevent the reduction of the area of wilderness, but at best slows and hinders it. In the long term, it is more than doubtful that legal protection of more wilderness areas will effectively save what remains of wilderness on the face of the Earth (even if properly designed and enforced to protect wilderness). Mining, logging, oil extraction, reservoirs, power lines, roads, etc. in the wilderness are not done for the sake of it, but to feed techno-industrial society and its growing population with the matter, space, and energy they inevitably need to sustain and continue to grow. And this need is not going to be avoided by nature protection laws or the declaration of protected areas.

Only the disappearance of the techno-industrial society will be able to effectively stop this assault on the wild.

Until then, studies like this one will be nothing more than precise and detailed chronicles of the progressive disappearance of wild ecosystems and the gradual expansion of industrial civilization to the farthest reaches of the planet.

THE LAST FRONTIERS OF THE WILDLANDS: Tracking the loss of intact forest landscapes from 2000 to 2013

By Peter Potapov, Matthew C. Hansen, Lars Laestadius, Svetlana Turubanova, Alexey Yaroshenko, Christoph Thies, Wynet Smith, Ilona Zhuravleva, Anna Komarova, Susan Minnemeyer, and Elena Esipova[a]

INTRODUCTION

Modification of terrestrial ecosystems by humans has a range of impacts, from complete transformation at the local scale to remote effects such as the impact of global climate on ecosystem functions and dynamics (1, 2). *No ecosystem can be considered truly intact anymore, as some degree of human impact is present everywhere.*

(3). Alteration and fragmentation of forest landscapes jeopardizes their ecosystem functions and implies loss of biological diversity and reduction of carbon storage (4, 5).

Wilderness forest lands[b], those forests that are least affected by human activity, have the highest conservation value in terms of the set of ecosystem services they offer (6-10). These areas are often irreplaceable in hosting biological diversity, stabilizing terrestrial carbon storage, regulating hydrological regimes, and performing other ecosystem functions (11). Their ability to carry out ecosystem functions and their resilience to natural disturbances and climate change are a function of their size. Many “umbrella”[c] species of mammals and birds, whose conservation could also favor the protection of other species around them, require large natural habitats to survive (12). Large forest wildlands[d] are the largest terrestrial stores of carbon, a function at risk due to conversion (deforestation) and forest degradation (10). Small forest areas, even if virgin, have less potential to preserve populations of widely distributed species and are less resilient to natural disturbances and the effects of climate change (4). Consequently, the size of wilderness[e] matters: the larger its size, the greater the conservation value of a territory.

The preservation of forested wilderness[f] requires robust mapping and monitoring systems that can be implemented at both local and global scales. In the last 30 years, several maps of the degrees of a Translation and adaptation by Último Reducto of the article —The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013”, published in *Science Advances* 3 (January 13, 2017). doi: 10.1126/sciadv.1600821. © 2017, the authors. *N. from t.*

[b] —Forest wildlands” in the original. *N. from t.*

[c] —‘Umbrella’ species”, in the original. Umbrella species are species that require large territories and whose protection, therefore, would also offer protection to many other *N. from t.*

[d] —Forest wildlands” in the original. *N. from t.*

[e] —Wildlands” in the original. *N. from t.*

[f] —Forest wildlands” in the original. *N. of t.* conservation of the wild character[g] of global ecosystems, as well as their degree of modification[h] (3, 13 and 14). Most have relied on data that was outdated, had coarse spatial resolution, and showed static inputs, which may prevent accurate delineation of wilderness loss[843]¹ along of time (15).

Delineation of forest wilderness[j] consists of two components: direct assessment of forest structural disturbance (including forest conversion, logging, and indirect effects such as human-caused fires) and assessment of the consequent fragmentation of the remaining forest landscapes due to these changes. Satellite data offers the most viable solution for recurrent global mapping and monitoring of human-caused disturbance and fragmentation (16).

We define an intact forest landscape (IFL) as an uninterrupted mosaic of forests and associated non-wooded ecosystems that do not exhibit any remotely-sensed signs of human activity or habitat fragmentation and that are large enough to support all diversity. indigenous biological diversity, including viable populations of species with a wide range (15). The global mapping of the IFF is based on a set of clear and simple criteria designed to allow mapping using satellites (see Materials and methods). The term —intact forest landscape” is not equivalent to the term —primary forest” as defined by the Food and Agriculture Organization of the United Nations (FAO) (17), and both should not get confused. Primary forests are part of IFLs, which also include intact non-forested ecosystems where climatic, edaphic or hydrological conditions prevent tree growth, temporarily treeless areas after a natural disturbance (for example, a forest fire of non-human origin) and bodies of water. IFLs may also include areas affected by low-intensity historical human influences, such as hunting, small-scale and scattered shifting cultivation, and pre-industrial selective logging. IFLs are made up of large expanses of primary forest with a minimum area of 500km², although smaller fragments of primary forest can be found outside IFLs.

¹ —Wilderness” in the original. *N. from t.*

² Original title: *The Vanishing face of Gaia.*

Here, we use the Landsat satellite image archive to map the global extent of PFIs in the years 2000 and 2013, in order to locate changes due to disturbance and fragmentation and to identify the causes of the changes.

RESULTS

We have evaluated the distribution and dynamics of PFIs within the current extent of forest ecosystems. We have defined “forest landscapes”[k] as those lands with a tree canopy cover greater than 20% in the year 2000, using a data set on global tree canopy cover (18) as reference. The current extent of forest landscapes (forest mosaics, naturally treeless ecosystems, and deforested areas) is called the “forest zone”³.

The forest area extends over more than 58 million km²[846], or 44% of the land area that is emerged and is devoid of ice. The extent of IFLs in the year 2000 totaled 12.8 million km²⁴, or 22% of the area of the forest area.

PFIs form distinctive regional clusters (Fig. 1 and Table 1), each with a unique history of alteration and fragmentation. In the humid tropics, PFIs are found in the Amazon and Congo river basins, the islands of Borneo and New Guinea, and the highlands of Southeast Asia. Tropical regions contain 48% of the total global IFL area. In dry tropical and subtropical regions, IFLs are rare or absent due to extensive conversions to agriculture, some of which occurred many centuries ago. Within the temperate and southern boreal forests of North America and Eurasia, only small areas of IFLs remain that have escaped commercial logging and agriculture. PFIs are abundant in the forests of the North Boreal Zone, primarily disrupted by mining, fossil fuel extraction, and man-made forest fires associated with tracks and highways. IFLs in the northern boreal zone make up 36% of the total global IFL area. In the year 2000 there were PFIs in 65 countries (Table 2).

Three countries (Russia, Brazil, and Canada) contain nearly two-thirds of the global IFL area. These countries are followed by the Democratic Republic of the Congo, Peru, the United States (mainly Alaska), Indonesia, Colombia and Venezuela, each of which contributes more than 2% to the global area of the IFL. French Guiana has the lowest degree of disturbance[m] of all countries, with IFLs occupying 79% of the forest area. This country is followed by Suriname, Guyana, Peru, Canada, Gabon and the Democratic Republic of the Congo, each of them conserving as IFLs more than 40% of their respective forest areas in the year 2000.

Globally, 30% of the world’s forest area (land with 20% or more tree canopy cover) was within IFLs in 2000. Most of the IFL area (82.3%) is covered with forest. The rest is covered by intact non-forested ecosystems (montane grasslands, treeless wetlands, and areas burned by natural forest fires) and by a small fraction of non-vegetated areas (water, rocks, and ice). Between 2000 and 2013, the global area of the IFL decreased by

³ “Forest zone” in the original. *N. from t.*

⁴ Original title: *The Vanishing face of Gaia*.

7.2%, a reduction of 919,000 km⁵ (Table 1). Tropical regions are responsible for 60% of the total IFL area reduction. Specifically, tropical South America lost 322,000 km⁶ of its IFL area, while Africa lost 101,000 km⁷. The temperate and southern boreal regions contributed 21% of the global loss of IPF area. North Eurasia alone lost 112,000 km⁸ of its IFL area. The remaining 19% of the IFL area reduction occurred in the forests of the northboreal zone of Eurasia and North America. Compared with the extent of the IFL in 2000, the smallest proportion of the IFL area reduction occurred in the northboreal regions and temperate forests of South America and the largest in Australia, Southeast Asia, Africa, and the temperate regions of South America. North America and Eurasia (Fig. 2). Three countries achieved 52% of the total IFL area reduction: Russia (lost 179,000 km⁹ of its IFL area), Brazil (157,000 km¹⁰) and Canada (142,000 km¹¹) . In proportion to the area of the IFL in the year 2000, the largest percentages of reduction in the area of the IFL were in Romania, which lost all its IFLs, and Paraguay, where 79% of its IFL area was lost; Laos, Equatorial Guinea, Cambodia, and Nicaragua each lost more than 35% of their IFL area (Fig. 3 and Table 2). If we assume that the loss of IFLs will continue at the same average rate as in the period 2000-2013, Paraguay, Laos, Cambodia and Equatorial Guinea will lose all their area of IFLs over the next 20 years. Another 15 countries will lose all of their PFIs in less than 60 years, including such PFI-rich nations as the Republic of Congo, Gabon, Cameroon, Bolivia and Burma.

We have used sampling to identify the main causes of the reduction in the area of the PFI. At a global level, the main agents of fragmentation and alteration have been logging (37% of the global reduction in IFL area), agricultural expansion (27.7%) and the spread of forest fires since infrastructures and wood installations (21.2%). Other causes include fragmentation due to mining and oil/gas extraction tracks, oil/gas pipelines and power lines (12.1%) and expansion of the road network for transportation (2.0%).). At the regional level, we have observed a multitude of main causes of the reduction of the area of the PFI (Fig. 4 and Table 3), while for each particular region a single cause is responsible for more than 50% of the reduction of the area of the PFI.

Using sample-based analyzes and the annual forest loss dataset (18), we found that 14% of the total IFL area reduction was due to forest disturbance. directly caused by logging, thinning and fires. The remaining 86% was due to the fragmentation caused by these disturbances and the construction of infrastructure. Annual forest loss within IFLs can be used as a proxy to understand the temporal dynamics of IFL area reduction. In tropical regions, annual forest loss within IFLs has increased over the last 13 years (Fig.

⁵ Original title: *The Vanishing face of Gaia*.

⁶ Original title: *The Vanishing face of Gaia*.

⁷ Original title: *The Vanishing face of Gaia*.

⁸ Original title: *The Vanishing face of Gaia*.

⁹ Original title: *The Vanishing face of Gaia*.

¹⁰ Original title: *The Vanishing face of Gaia*.

¹¹ Original title: *The Vanishing face of Gaia*.

5). The average forest loss within the IFF reduction area in the period 2011-2013 has been three times the average in the period 2001-2003 for each of the tropical regions, with the highest increase in Central Africa.

Table 1. Extension of the PFI and reduction of its surface in each geographic region.

Geographic region | Surface area of forest area (km¹² x 106) | PFI area in 2000 (km¹³ x 106) | Proportion of area PFI forestry in 2000 (%) | Proportion of forest landscape* within the PFI 2000 (%) | IFL share of global IFL area in 2000 (%) | PFI area in 2013 (km¹⁴ x 10¹⁵) | Reduction of PFI area, 2000-2013 (%) | Reduction of PFI area, 2000-2013, no attributed to fires (%) |

Africa	9.08	1.00	11.0	99.8	7.8	0.90	10.1	10.1

Australia	1.01	0.13	12.4	55.6	1.0	0.10	21.9	15.3

South America, temperate zone	0.41	0.16	38.2	43.4	1.2	0.15	1.3	0.9

¹² Original title: *The Vanishing face of Gaia*.

¹³ Original title: *The Vanishing face of Gaia*.

¹⁴ Original title: *The Vanishing face of Gaia*.

¹⁵ A couple of examples:

South Amer- ica, trop- ical zone	14.70	4.43	30.1	98.9	34.6	4.11	7.3	7.1

North Amer- ica, tem- perate and south- ern zones	5.85	0.54	9.2	66.5	4.2	0.46	15.5	11.2

North Amer- ica, North Boreal Zone	3.89	3.04	78.2	63.8	23.7	2.94	3.3	0.3

north of

Eurasia, temperate and southern zones | 11.96 | 1.23 | 10.3 | 69.8 | 9.6 | 1.12 | 9.1 | 7.4 |

north of

Eurasia, northboreal area | 3.33 | 1.57 | 47.0 | 75.7 | 12.2 | 1.50 | 4.4 | 1.8 |

Southeast

Asian | 7.38 | 0.72 | 9.8 | 93.7 | 5.6 | 0.62 | 13.9 | 13.9 |

World total	57.60	12.81	22.2	82.3	100.0	11.89	7.2	5.7	*Forest landscape[n] is defined here as land with greater than 25% tree canopy cover, as described by the global tree cover product (18).

Of the total area of the PFI in the year 2000, 12.4% was within protected areas (PAs), subject to a management regime compatible with categories I to III of the International Union for Conservation of Nature (IUCN) (19). Australia and temperate South America have the highest proportion of IFLs subject to legal protection (47.4% and 43.7%, respectively), while

[n] “Forest” in the original. *N. of the temperate and southboreal t.* of northern Eurasia (7.7%) and northboreal areas (7.7% in North America and 5.2% in Eurasia) have the lowest. Forty of the 65 countries in which PFIs were present in the year 2000, had at least 10% of the area of PFIs subject to legal protection. Uganda, the Dominican Republic, Thailand and Cuba had more than 90% of their area protected from IFLs. Some countries did not include any IFLs in PAs in categories I to III, including many countries in Southeast Asia (Lao People’s Democratic Republic, Vietnam, Cambodia, and the Philippines), Papua New Guinea, Ethiopia, Angola, and Nicaragua.

Using sample correspondence analysis, we found that the reduction in IFL area for reasons other than fire was 3.4 times greater outside PAs (6.2%) than inside PAs (1.8%). In most regions we have found a large difference between protected and unprotected areas in terms of reduction in IFL area (Table 4). In Africa, North America, and

Eurasia, the reduction in IFL area was more than 4 times greater outside PAs than within them, while it was 2.6 times greater in Southeast Asia and nearly twice as large in tropical Asia. South America.

To study the effect of legal protection and voluntary certification of forest management on reducing PFI area due to logging, we analyzed PAs and logging concessions in the three Central African countries for which information is available. update on their forest management: Cameroon, Gabon, and the Republic of the Congo. Some of the concessions were certified to Forest Stewardship Council[o] (FSC) standards.

Certified concessions had the same or greater proportion of PFI area reduction than non-certified ones, while PFI area loss was at least four times lower in APs than in logging concessions (Table 5).

Table 2. Number of PFI and reduction of its area in each country.

Country name Code of country (for Fig. 3) PFI area in 2000 (km[847] x 103) Proportion of the PFI in the forest area in 2000 (%) Proportion of PFI of the global area of the IFL in 2000 (%) Surface reduction IPP, 20002013 (%) Surface reduction from IPP, 20002013, not attributed to fires (%)						
Angola	AUG	2.9	0.3	0.02	13.7	13.7
Argentinian	ARG	39.9	6.5	0.3	2.0	1.8
Australia	AUS	82.2	9.8	0.6	32.7	22.8
Belize	BLZ	4.3	19.7	0.03	4.8	4.8
Bhutan	BTN	6.4	19.3	0.05	15.5	15.5
Bolivian	BOWL	233.3	28.9	1.8	19.6	18.3

Brazil	BRA	2476.1	31.7	19.3	6.3	6.2

Brunei	BRN	2.0	35.1	0.02	17.0	17.0

Cambodia	KHM	1.1	0.9	0.01	38.2	38.2

Cameroon	WRC	52.8	13.4	0.4	25.2	25.2

Canada	CAN	3040.3	51.0	23.7	4.7	23

Republic						

Central African | coffee | 8.7 | 1.5 | 0.1 | 34.4 | 34.4 |

Chile	CHL	131.4	36.9	1.0	1.3	0.9

Chinese	CHN	45.0	1.6	0.4	11.5	11.2

Colombia	COL	349.2	31.0	2.7	1.3	1.3

Costa Ri- can	IRA	3.2	6.2	0.02	3.0	3.0

Ivory Coast	CIV	4.6	1.7	0.04	17.5	17.5

Cuba	CUB	0.5	0.5	0.004	0	0

Country name	Code of

country (for Fig. 3) | Area of the PFI in 2000 (km¹⁶ x 103) | Proportion of the PFI in the forest area in 2000 (%) | Proportion of PFI of the global area of the IFL in 2000 (%) | Surface reduction IPP, 20002013 (%) | Surface reduction from IPP, 20002013, no attributed to fires (%) |

Dominican Republic	SUN	0.8	1.7	0.01	29.0	1.6

Ecuador	ECU	53.3	22.3	0.4	5.3	5.3

Equatorial Guinea	GNQ	4.2	15.8	0.03	45.2	45.2

Ethiopia	ETH	3.7	1.4	0.03	9.6	9.6

Finland	END	9.7	3.1	0.1	0.2	0.2

French Guiana	GUF	65.4	79.1	0.5	5.7	5.7

Gabon	GAB	108.8	41.2	0.8	22.9	22.9

Georgian	GEO	9.0	18.3	0.1	0.7	0.7

¹⁶ Original title: *The Vanishing face of Gaia*.

Guatemalan	GMT	5.7	5.2	0.04	13.3	13.3

Guyanese	GUY	144.1	69.6	1.1	11.3	11.3

Honduras	HND	6.7	6.0	0.1	28.6	28.6

India	IND	33.7	5.6	0.3	1.6	1.6

Indonesian	IDN	359.2	20.1	2.8	10.8	10.8

Japan	JPN	1.2	0.4	0.01	0.01	0.01

Kazakhstan	KAZ	4.4	16.6	0.03	23	23

Laos	LAO	8.5	3.8	0.1	47.9	47.9

Liberian	LBR	4.7	5.0	0.04	32.2	32.2

Madagascar	MDG	17.2	7.2	0.1	19.0	18.5

Malaysia	MYS	21.1	6.5	0.2	25.1	25.1

Mexico	MEX	15.0	1.8	0.1	2.8	2.6

Mongolian	MNG	11.7	12.6	0.1	12.5	0.4

Burma	RMM	52.9	10.1	0.4	30.9	30.9

nepal	NPL	0.6	0.6	0.004	0	0

New Zealand	NZL	43.1	25.4	0.3	1.3	1.2

Nicaraguan	IAS	10.3	8.0	0.1	38.1	38.1

Nigerian	NGA	3.0	1.3	0.02	5.3	5.3

Norway	NOR	1.8	1.4	0.01	1.0	1.0

Panama	BREAD	14.5	19.6	0.1	19.8	19.8

Country name			Code of			

country (for Fig. 3) | Area of the PFI in 2000 (km¹⁷ x 103) | Proportion of the PFI in the forest area in 2000 (%) | Proportion of PFI of the global area of the IFL in 2000 (%) | Surface reduction IPP, 20002013 (%) | Surface reduction from IPP, 20002013, not attributed to fires (%) |

¹⁷ Original title: *The Vanishing face of Gaia*.

Paraguay	PRY	44.5	11.1	0.3	79.3	79.3

Peru	PER	567.2	68.5	4.4	6.1	6.1

Philippines	PHL	4.0	1.6	0.03	9.5	9.5

Republic of						

Congo | COG | 138.7 | 40.7 | 1.1 | 17.7 | 17.7 |

Romania	ROU	1.0	0.6	0.01	100.0	100.0

Russia	RUS	2744.3	28.3	21.4	6.5	4.3

Samoan	WSM	0.7	23.8	0.01	0.6	0.6

Solomon Islands	VMS	7.8	32.3	0.1	52.9	52.9

Suriname	SOUTH	107.4	73.8	0.8	5.7	5.7

Sweden	S.W.E.	11.6	3.0	0.1	0.8	0.8

Tanzanian	TZA	4.1	0.8	0.03	23	23

Thailand	THA	19.4	7.0	0.2	7.8	7.8

Ugandan	UGA	1.0	0.7	0.01	0.9	0.9

United States	USA	539.3	14.2	4.2	7.9	0.2

Vanuatu	VUT	0.7	7.5	0.01	1.1	1.1

Venezuela	COME	312.8	35.7	2.4	1.5	1.5

Viet Nam	VNM	4.1	1.7	0.03	25.5	25.5	[DISCUSSION]

Causes of the reduction of the area of the PFI

Industrial logging, resulting in the alteration and fragmentation of the forest landscape, was the main global cause of IFL area reduction. In Africa and Southeast Asia, selective logging was the predominant cause of IFL loss (77% and 75% of total IFL area loss, respectively), while clearcutting was the main cause of IFL loss in the temperate and southboreal regions of North America and Eurasia (68% and 54%, respectively). The relative proportion of forest loss and fragmentation within IFL reduction zones depends on the logging method and the intensity of logging. Clearcutters caused a greater proportion of forest disturbance (15% of the total IPF area reduction) compared to selective logging (1.2%), with the remaining IPF reduction due to fragmentation caused by facilities and lumber tracks. Southeast Asia had a higher proportion of clearing within selectively logged areas than tropical Africa and South America (1.4% vs. 0.3% for each of the latter).

The expansion of logging in intact forest areas has many direct effects on ecosystem functions, including reduced carbon storage (20), decreased habitat suitability (6, 21) and the increased vulnerability to forest fires caused by humans (22, 23). *Fragmentation of the forest landscape caused by logging and logging leads to direct habitat loss (24) and increases the incidence of poaching (25), resulting in the loss of species. Even within areas designated for sustainable forest management, as is the case with some tropical logging concessions, the construction of new logging roads initiates a cascade of land-use change and a consequent reduction in the conservation*

value of the landscape. The example of the Republic of the Congo (Fig. 6) shows how the expansion of logging infrastructure and a new hydroelectric project have significantly reduced the area of its IFL. Agricultural expansion, forest fires and the potential increase in unregulated hunting (26) coincide with the expansion of the network of logging trails.

Agricultural expansion was the second most important cause of IFL area reduction. In tropical South America, the expansion of agriculture in general and pastures in particular contributed 65% and 53% of the total loss of IFL area, respectively. The expansion of industrial crops (eg, soybeans) was not detected as a cause of the reduction in PFI area using our sample-based analysis. IFLs were not directly affected by the expansion of industrial farming in South America because it occurred mainly in areas that had previously been converted to pasture (27). In tropical Africa and Southeast Asia, the expansion of smallholder slash-and-burn agriculture contributed 23% and 15%, respectively, to the total reduction in IFL area.

The establishment of oil palm plantations contributed 0.2% of the total reduction in PFI area. In all tropical regions we found new oil palm plantations affecting the PFIs (Fig. 7). Plantations typically follow the expansion of selective logging and represent an example of how industrial logging operations can trigger a cascade of interventions that ultimately result in the ultimate conversion of natural forests to industrial monoculture plantations (28).

Infrastructure-associated forest fires, which we therefore assume to be human-caused, contributed to 21% of the total PFI area reduction. Fire-related degradation was found in all regions except Southeast Asia. The absence of fires causing PFI degradation in Indonesia is explained by the fact that the remaining PFIs there are located in remote montaneous areas, while fires are much more frequent in the fragmented and degraded lowland forests. Fire was the main cause of PFI area reduction in northern regions (91% in North America and 56% in northern Eurasia) and caused more than 20% of PFI reduction in temperate North America and Eurasia, as well as Australia. Excluding fires as a cause of PFI degradation would change the global reduction of the PFI area, from 7.2% to 5.7% (Table 1) but would not lead to notable changes in the ranking of regions based on the proportion of PFI area lost.

Table 3. Analysis based on samples of the causes of the reduction of the PFI.

Total reduction of the PFI surface area

(km[848] x 103) | Number of samples (1 km¹⁸

¹⁸ Original title: *The Vanishing face of Gaia*.

each one) | PFI area reduction due to proximate causes, km¹⁹ x 103
(standard error, km²⁰ x 103) |

Forest fires	Wood extraction	Expansion of farmland and pastures	Mining, oil and gas, hydroelectric	Other transport, tourism

Africa	101.3	100	0	77.5 (0.4)	22.8 (0.4)	0	1.0 (0.1)

Australia	27.4	50	6.6 (0.2)	0	0.5 (0.1)	17.6 (0.2)	2.7 (0.1)

South America, temperate zone	2.1	50	0.5 (0.01)	0.9 (0.01)	0	0	0.7 (0.01)

South America, tropical zone	321.5	300	7.5 (0.3)	68.1 (0.8)	209.0 (0.9)	28.4 (0.5)	8.6 (0.3)

North America, temperate and southern zones	83.3	84	24.8 (0.4)	56.6 (0.4)	0	1.0 (0.1)	1.0 (0.1)

¹⁹ Original title: *The Vanishing face of Gaia*.

²⁰ Original title: *The Vanishing face of Gaia*.

North Amer- ica, North Boreal Zone	101.2	116	92.5 (0.3)	0	0	8.7 (0.3)	0

north of

Eurasia, temperate and southern zones | 112.1 | 113 | 23.8 (0.4) | 60.0 (0.5) | 0 | 26.3 (0.4) | 2.0 (0.1) |

north of

Eurasia, northboreal area | 69.5 | 87 | 39.2
(0.4) | 1.6 (0.1) | 0 | 28.8 (0.4) | 0 |

Southeast

Asian | 100.2 | 100 | 0 | 75.6 (0.4) | 22.6 (0.4) | 0 | 2.0 (0.1) | Energy production (oil and gas extraction and hydroelectricity) and mining operations are important causes of the reduction of the area of the IFL at a global level due to the fragmentation effect caused by its transport infrastructures. Oil and gas extraction was the main cause of fragmentation in northern Eurasia (particularly in the Russian Federation), with 41% of IPF reduction in the northboreal zone and 23% in the southboreal and temperate zones. Russia is the largest producer of crude oil and the second largest producer of natural gas in the world. The recent expansion of oil and gas exploration and extraction in eastern Siberia has caused fragmentation of forest wilderness[p] through the installation of new oil and gas pipelines and infrastructure for extraction, often accompanied by logging and man-made fires . Mining and mining prospecting (mostly gold) played a very important role in

Australia (64% of the total IFL reduction) and in tropical South America (9%).
Table 4. *Reduction of IFL area within and outside of IUCN PA categories I to III. Area-based estimates represent the area calculated from the map. The sample-based estimates are based on combined analyzes carried out only within the parts of the PFIs susceptible to degradation. This analysis only considers the reduction in the area of the PFI that was not attributed to fires in the period 2000-2013.*

Area-based estimates	Estimates based on samples and standard error (SE)

Region	IFL included in IUCN PA categories I-III in 2000 (%)	Reduction of PFI surface within PsA (%)	Reduction of the PFI surface outside the PAs

(%) | Reduction of PFI surface within PAs, % (ES, %) | Reduction of the PFI area outside the PAs, % (ES, %) |

Africa	10.8	1.6	11.2	5.5 (0.72)	25 (1.37)

Australia and

New Zealand | 47.4 | 9.6 | 20.5 | 54.6 (1.57) | 44.1 (1.57) |

South America, temperate zone	43.7	0.4	1.3	1.6 (0.40)	1.1 (0.33)

South America, tropical zone	15.1	2.0	8.0	8.0 (0.86)	14.6 (1.12)

North America, temperate zone	34.0	1.1	16.4	5.2 (0.70)	24.6 (1.36)

north of

Eurasia, temperate zone | 7,7 | 1.4 | 7.9 | 3.2 (0.56) | 17.5 (1.20) |

Southeast Asia	12.7	4.6	15.2	6.8 (0.80)	17.9 (1.21)	Fragmentation generally predominates over forest thinning as a factor in reducing the area of the IFL. Their relative contribution depends on the type of disturbance. The highest percentage of forest clearing has been observed for oil palm plantations (43% of the total reduction in the area of the PFI) and for forest fires (41%), followed by clearing plants (15%). , pastures (15%)

The data set on the change in the PFI in the period 2000-2013 shows that 55% of the total loss of forest area occurred within stable zones of the PFI and, therefore, it was assumed that it responded to the natural dynamics of the ecosystems. However, for tropical regions, the proportion of natural disturbances within the PFIs was small (8.6% of the total loss of forest area in the 2000 PFIs).

Legal protection of PFIs

In all regions, the proportion of IFL area reduction was lower within PAs than outside them (Table 4), suggesting that legal protection was effective in preventing IFL loss. However, this conclusion might not be valid due to the non-random distribution of PAs within PFI zones (29). In order to explain the variable vulnerability of the PFI to human-caused disturbance and fragmentation, we performed a matching-sample method to account for the non-random distribution of PAs. The results confirmed that legal protection has been effective in slowing the reduction in IFL area in all regions except Australia (where roads have been built near PA boundaries) and temperate South America (where new tourist infrastructures have been developed in a national park). However, when we analyze the causes of the reduction in the area of the IFL, we note that legal protection has not always been an effective way of limiting the expansion of agriculture. Of the 10 PAs in Africa classified as IUCN Categories I and II that experienced more than 1% loss of IFL area, 7 were subject to smallholder expansion.

Two of these PAs were in the Andasibe-Mantadia National Park[q] (where all the PFIs disappeared) and in the Tsaratanana Strict Nature Reserve[r] (where 28% of the PFI area was lost). In both cases, swidden agriculture expanded within the park boundaries. The same process was observed in the Virunga National Park (Democratic Republic of the Congo), which lost 3.3% of its IFL area due to agricultural expansion.

[q] Located in Madagascar. *N. of t.* [r] *Idem. N. of t.*

Another cause of the reduction of the surface of the PFI within the PAs is the development of new infrastructures. In some cases, new transport infrastructures cause fragmentation, as in the Domogled-Valea Cernei National Park (Romania). In other cases, the development of infrastructures for tourism and recreation cause reduction of the area of the PFI, for example, the expansion of the road network in the Puyehue National Park (Chile) and the construction of a ski resort within Sochinsky National Park (Russia). Although some of these infrastructure projects were developed to increase PA revenues and stimulate public awareness of the importance of nature conservation, they nonetheless had the effect of reducing the extent of forested wilderness due to fragmentation.

Many PFIs contain high-value timber resources, and logging and associated fragmentation due to runways are major causes of reduced PFI area worldwide. The standards for responsible forest management, including those of the FSC, seek to reconcile economic development based on forest exploitation with conservation. FSC considers PFIs to be a type of landscape of high conservation value and the FSC standard states that their degradation should be avoided. In 2014, the FSC General Assembly adopted

a motion (Motion 65) calling on FSC to do the following: —ensure that Certificate Holders put in place protection measures within PFI cores (for example, establish areas that remain unexploited, legally protected areas, conservation reserves, moratoriums, communal reserves, indigenous protected areas, etc.) ensuring a management that preserves its intact landscape character” (30). If Motion 65 were to be implemented, we should in future at least expect PFI fragmentation to proceed more slowly within certified than non-certified concessions. Our results for the period 2000-2013 suggest that the rate of IPP fragmentation due to selective logging in Central Africa is higher within FSC-certified concessions than outside of them, due to selective logging and fragmentation caused by the construction of logging roads (Table 5). By definition, selective logging and the establishment of associated infrastructure in a PFI reduces its area. Although we do not know to what extent PFI fragmentation is actively prevented by logging operations, it is clear that selective logging within FSC-certified concessions is a significant factor causing the reduction of PFI area in central Africa. For other regions, sufficiently detailed information about logging concessions and their certification is not available, preventing a similar analysis.

Regional approaches to monitoring the PFI

National projects focused on characterizing —primary forests”, —high conservation value forests” or —wilderness areas[t]” are complementary to the IPP mapping initiative. Such maps often provide information about smaller patches of high conservation value forest located outside of larger wilderness[u] areas. The work of Global Forest Watch Canada (GFWC) is an example of regional mapping of the PFI that uses different criteria than those used in our global method. The GFWC criteria take into account all areas

[s] ”Intactness” in the original. *tn.. t* —Wilderness areas” in the original. *tn..*

[u] —Wilderness areas” in the original. *N. of t.* burned within PFIs, regardless of the cause of the fire, and require a smaller minimum area for a piece of land to be considered a PFI (31, 32). The GFWC IPP map has been updated for the year 2013 (33), allowing a comparison of regional and global IPP maps. The GFWC map for 2013 showed that Canada had a total area of IFLs 1.4 times greater than that shown on our global map. However, 98.6% of the intact area of our global map is included in the GFWC map, coinciding in terms of location and extent of core wilderness areas.

Table 5. IPL extension and surface reduction within logging concessions in three Central African countries. *The spatial database of logging concessions in Cameroon (2013), Republic of the Congo (2013), and Gabon (2012) obtained from the World Resources Institute*²¹ [<http://www.wri.org/our-work/project/congo-basin-forest-atlases>][*(wwwri.org/our-)*][<http://www.wri.org/our-work/project/congo-basin-forest-atlases>][*work/project/congo-basm-forest-atlases*]].

**Country | Proportion of total area of
PFI granted in 2000 (%) | Proportion of PFI area**

²¹ —World Resources Institute” in the original. *N. from t.*

awarded with FSC certificate in 2000 (%) | Reduction of
 IPF area in the period 2000-2013 in the country (%) | Reduction of
 PFI area in the period 2000-2013 in all concessions (%) | Reduction of
 IPF area in the period 2000-2013 in the
 FSC certified concessions (%) | Reduction of
 IPF area in the period 2000-2013 in PAs
 (IUCN categories I-III) (%) |

Cameroon	40.5	38.4	25.2	41.1	84.5	0.3

Republic of the Congo	42.4	61.6	17.7	37.1	41.9	4.8

Gabon	48.4	29.7	22.9	37.9	37.0	9.0	The standard method presented in this article is capable of offering a globally consistent characterization of the extent of PFIs and their change over time. However, for regional mapping initiatives, regional relevance may be a higher priority than global consistency. Regional studies may wish to deviate from

A major difference between the global PFI assessment presented here and the regional PFI assessments conducted by the GFWC is the treatment of fire-related disturbances. In general, it is not possible to determine if a fire had a natural origin or if it was caused by people. In the overall study, burned areas in the vicinity of transportation infrastructure, agricultural areas, and logging facilities were assumed to be caused by humans and were therefore treated as a PFI reduction factor. Although lightning strikes can start forest fires, several studies have found that most fires in the vicinity of infrastructure and logging facilities are human-caused, both in boreal forests (22, 34) as well as temperate (35, 36) and tropical (37). However, some large forest fires can be of natural origin even if they occur next to infrastructure (38, 39). Our approach has been to create a set of mapping standards that can be consistently applied on a global scale. For burned areas, our standard assumes that fires in the immediate vicinity of areas with human access have most likely been caused by humans. Regional conservation specialists (40) have questioned the utility of applying globally consistent criteria at regional scales, particularly when interpreting the causes of fires in boreal Canada. In response to these objections, our overall analysis differentiates between the reduction in PFI due to fire and that due to other causes.

landscape of the PFI in the Republic of Congo (map center at 16°0'E 1°12'N). The infrastructure and extent of PFI within of the area are shown as they appeared in September 2016. The map shows the expansion of settlements and regional roads for transport and timber extraction from the year 2000 to 2016. New settlements and agricultural areas appear along existing and established roads. The logging expansion caused forest fires that started from roads and cleared areas in the jungle. In September 2016, a reservoir was built on what remained of the PFI area, causing permanent fragmentation and transformation of the surrounding landscape.

The IFL concept is defined to map the large expanses of unfragmented primary forest. A different set of criteria, using a lower threshold for the minimum size of each piece of land, would be needed to map small areas of primary forest. Our previous work in Central Africa and insular Southeast Asia showed that substantial areas of primary forest exist outside of IFLs. We found that 38.6% of the primary forest area in the Democratic Republic of the Congo (41) is located outside IFLs, while on the Indonesian island of Sumatra the proportion is 73.2% (28).

The method presented here can be used to identify priority areas for conservation at the regional and national levels if the criteria of minimum degree of disturbance and size are adjusted for that purpose when choosing an area.

Accuracy of the global map of the PFI

In order to assess the accuracy of the IFL change map for the period 2000-2013, we used the same 1,000 random samples that we used to assess the causes of the IFL area reduction. Samples were interpreted separately from map creation. The sampling

design made it possible to estimate errors of commission (that is, change that had been falsely attributed to human causes) but not errors of omission (change caused by humans that was missed, that is, not left out). reflected in the change map). Visual interpretation of the Landsat images and the high-resolution images available on Google Earth confirmed that 92% of the sampled IPL area reduction had been correctly classified. It was not possible to confirm, based on Landsat images or high spatial resolution satellite images, whether the alterations of the remaining sampled area (8%) were caused by humans.

A partial verification of the 2000 IPP map carried out by Greenpeace Russia and the GFWC (42, 43) confirmed that the intact areas within the boreal and temperate forests of European Russia and Canada had been correctly classified. An alternative approach to verification focused on forest structure to differentiate intact forests from forests located in degraded or disturbed landscapes. The studies by Margono *et al.* (28) and Zhuravleva *et al.* (41) used data from the Sistema Geoscientist of Laser Altimeters[850]²² to examine the structure of the tree canopy inside and outside the IFLs of Sumatra (Indonesia) and the Democratic Republic of the Congo. Their results revealed a statistically significant difference between intact forests and other (fragmented and disturbed) forests in mean forest height.

The role of the PFI in mitigating climate change

The primary forests remaining within IFLs represent the most important carbon store in the tropical biome (44). Using as reference a carbon map of tropical forests made in the early years of the 21st century (45), we estimated that the total carbon stored in the biomass of the tropical forest zone was 243 Gt C around the year 2000, of which the PFIs stored 97 Gt C (40%). The average carbon density in IFLs is higher than in the rest of the tropical forest zone: 3.7 times higher in Africa, 3.4 times higher in South America and 1.7 times higher in Southeast Asia.

PFIs in boreal and temperate regions differ from those in the tropics in that they have less biomass per unit area and lower productivity than managed forests. In 2000, mean stand volume growth[y] in North America and Eurasia was 1.4 times greater in forests outside the PFIs (145.5 m²³/ha) than within them (103.1 m²⁴/ha) (46). This has historical reasons. In the past, temperate and subboreal forests have been cleared, converted to managed forests or fragmented due to infrastructure, leaving mostly less productive forests (particularly those located in peatlands and mountains) as PFIs (42). However, the vast areas of boreal PFIs constitute a large and relatively stable carbon pool, both above and below the ground surface, which plays an important

²² —“Geoscience Laser Altimeter System” in the original. *N. from t.*

²³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

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role in the global climate system. Although the recent increase in the frequency and intensity of boreal forest fires (39) threatens long-term aboveground carbon storage in northern forests, PFIs have been shown to have a lower frequency of fires compared to fragmented and exploited areas (22). Permafrost protection is another important function of the PFI. The construction of roads and oil/gas pipelines have multiple direct and indirect effects on the permafrost, increasing its vulnerability to thawing (47). Nearly 52% (2.6 million km²⁵) of the total area, both continuous and discontinuous, of permafrost within the North American and Eurasian forest zone lies within the remaining PFIs (48< /em>).

CONCLUSIONS

The degree of undisturbed[z] is a good indicator of the overall conservation value of a forest landscape (7, 8). It is related to specific ecosystem values, such as the integrity of ecosystems and their resilience to natural disturbances and ongoing climate change. It is also related to other ecosystem functions, such as biodiversity (49). It can be reduced very quickly, in a matter of months or years, through fragmentation and access, even without change in tree canopy cover. On the other hand, the absence of alteration [aa] is difficult to recover, at least in a short period of time. Is

and —The average growing stock” in the original. It refers to the mean volume of all living trees in an area of forest or woodland that are greater than a certain diameter at breast height. *N. from t.*

[z] —Intactness” in the original. *N. from t.*

[aa] *Idem. N.* is why intact landscapes should be treated as having high (or even highest) conservation value. The conservation value of an intact area is dependent on its size as many umbrella species of mammals and birds require large natural habitats to survive (12, 50). This is why the size of wilderness areas should always be considered when assessing the conservation value of wilderness[bb]. The IUCN Congress held in Hawaii in 2016 adopted a motion (Motion 048) that —encourages states, the private sector and financial institutions to: a. prevent the loss and degradation of primary forests, including intact forest landscapes; b. promote the conservation of primary forests, including intact forest landscapes” (51). National attempts to protect IFLs include expanding the network of PAs and establishing a wilderness management system[cc] similar to that of the United States (52). Extensive forested wilderness[dd] often spans international borders, highlighting the need for effective international conservation strategies (10). IFLs offer a framework for maintaining large, uninterrupted, and often transnational blocks of forest wilderness[ee]. The large pools of carbon found within IFLs illustrate their potential to benefit climate change mitigation strategies. This study has shown that legal protection is an effective policy to reduce the degradation of IFLs. We suggest that PFIs should be taken into account when reviewing

²⁵ Original title: *The Vanishing face of Gaia*.

and expanding AP networks. We also suggest that monitoring of the intactness[ff] of forests should be treated as an important aspect of forest assessments, both nationally and globally.

MATERIALS AND METHODS

The extent of the forest area was mapped using the tree canopy cover dataset for the year 2000 (18), with a tree canopy cover threshold of 20%. Inland water bodies and ecosystems that naturally lack trees were included in the forest zone. Areas of land located in the forest zone but with a continuous area of less than 500 km²⁶ were not taken into account. The geographic regions within the forest zone (Fig. 1) were delimited using the natural boundaries between the forest zones. The boundary between the northboreal and southboreal/temperate regions in North America and northern Eurasia was based on analysis of Landsat data and is *de facto* the dividing line between lands that had been subject to industrial timber extraction until 2013 and those that did not.

A PFI is defined as an unbroken mosaic of forests and their associated non-wooded ecosystems that does not show any remotely-sensed observable signals of human activity or habitat fragmentation and is large enough to support all native biodiversity, including viable populations of species with large territories (15). A PFI includes both forested ecosystems and ecosystems that are naturally treeless. Two main criteria were used to differentiate a PFI from other surrounding landscapes: (i) ecosystem disturbance (ii) landscape fragmentation through infrastructure and disturbance. The areas that had been disturbed or

[bb] —Wildland” in the original. *N. from t.*

cc —Wilderness areas” in the original. *N. of t.*

[dd] —Large forested wildlands” in the original. *N. from t.*

[ee] —Forest wildlans” in the original. *N. of the t.*

[ff] —Intactness” in the original. *N. del .t.* exploited (by farming, logging or mining) were excluded, along with a 1 km wide buffer zone (53) on each side of the infrastructure elements (roads and tracks, oil/gas pipelines, power lines and navigable rivers). Past disturbances 30 to 70 years or more ago, small-scale and dispersed shifting cultivation, non-industrial logging by native forest dwellers, and low-intensity disturbances not directly observable in data obtained by remote sensing (hunting and forest grazing) were not considered factors of alteration or fragmentation of the IPF. An IFL extension had to have (i) a minimum size of 500 km[852], (ii) a minimum width of 10 km, and (iii) a surrounding corridor/appendage area with a minimum width of 2 km. Any area that fell below these thresholds, for example due to fragmentation, logging or fire, was discarded entirely.

²⁶ Original title: *The Vanishing face of Gaia*.

The data used as sources for the mapping and monitoring of the PFI were taken from the global archive of medium spatial resolution images from the Landsat satellite. We used a collection of Landsat images from the same date (15) to map the PFIs from the year 2000. Landsat images from around the year 1990 were used for forest disturbances in the tropics that may be invisible in the images of the year 2000 if they are not known in advance. For the 2013 PFI update, we used composites of uninterrupted and cloudless Landsat data and the results of a Landsat-based annual forest loss study (18). PFI mapping for 2000 and 2013 was performed using visual interpretation of Landsat PFI images. A few ancillary data sources were used to aid in interpretation, including national transportation maps, results of surveys of forest cover change, and high-resolution remotely sensed data from Google Earth. We use a “reverse logic” approach to delimit PFIs. Initially, we considered the entire forest area as a candidate for PFI status, then systematically identified and eliminated disturbed and fragmented areas until all available evidence was exhausted. We then considered the remaining unfragmented portion of the forest area that met our size criteria as PFI. When we estimated the reduction in PFI area between 2000 and 2013, we rejected all extensions that fell below the degree of undisturbed[gg] threshold during that period, even if only by a small margin. Therefore, an extension of 800 km²⁷ that was split in half by a road into two pieces of 400 km²⁸ each would be registered as a reduction of the PFI area of 800 km²⁹.

To identify the causes of the reduction in the area of the PFI, we used a sampling method based on a random stratified design. We allocated a total of 1,000 IFL surface reduction samples, each 1 km³⁰ in size, among all IFL regions (Fig. 1), in proportion to the IFL surface reduction for each region. in absolute terms (Table 1). For each sample, we examined the causes of both IFL reduction and forest loss, using all available remote sensing data (annual composites of Landsat data, data from Google Earth).

In order to estimate the effectiveness of legal protection as a means of reducing IFL acreage loss, we used a correspondence sampling method to include the non-random distribution of PAs. To encompass the factors that influence the probability of IFL surface reduction, we use the following dimensions: (i) elevation (54), (ii) slope, (iii) distance to boundaries of the IPP, (iv) tree canopy cover in the year 2000 and (v) the human footprint index (3). In each country and ecozone, we evaluated the distribution of these dimensions in areas that had lost their IFL status during the period between 2000 and 2013, allowing sample plots to be selected only where the value of each variable was within ± 1 standard deviation from the mean, that is, in areas with a high probability of change. In each geographical region, we randomly assigned a set of 1000 samples of 1 ha each within the protected part of IFLs (in IUCN categories I to III) (19). We then selected the most closely matched sample from the unprotected portion

²⁷ Original title: *The Vanishing face of Gaia*.

²⁸ Original title: *The Vanishing face of Gaia*.

²⁹ Original title: *The Vanishing face of Gaia*.

³⁰ Original title: *The Vanishing face of Gaia*.

of IFLs in the same country (Global Database of Administrative Areas <http://gadm.org/> [<http://gadm.org/>]) and in the same ecozone (55) using Euclidean distance in metric space. As a result, two correlated populations of samples (protected and unprotected) were obtained for each region. Differences in sample-based IPL surface area change rate between these two populations were used as an unbiased measure of IPL reduction within and outside PAs.

To analyze the effect of FSC certification on reducing PFI area in selected Central African countries, we used the database on logging concessions collected by the World Resources Institute“ [<http://www.wri.org/our-work/project/congo-basin-forest-atlases>](www.wri.org/our-work/project/congo-basin-forest-atlases). The spatial database on logging concessions was used for three countries: Cameroon (database for the year 2013), Republic of the Congo (2013) and Gabon (2012).

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 hh —Global Administrative Areas Database” in the original. *N. from t.*
 [jj] There is a translation in Spanish: —Human domination of ecosystems”:
<http://www.naturalezaindomita.com/textos/ecologia/la-dominacin-humana-de-los-ecosistemas-de-la-tierra>[<http://www.naturalezaindomita.com/textos/ecologia/la-human-domination-of-the-ecosystems-of-the-earth>.]
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Availability of data and materials

Maps of IFL extent and change in GIS format are available on the project *web* page [<http://www.intactforests.org/>][[\(www.intactforests.org/\)](http://www.intactforests.org/)] and through the Global Forest Watch data portal [<http://www.globalforestwatch.org/>][[\(http://www.globalforestwatch.org/\)](http://www.globalforestwatch.org/)]. All the tabular data necessary to evaluate our conclusions are present in the article. Additional data related to this article can be requested from the authors.[kk]

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Presentation of “The architecture of nature”

The following article is worth reading for two reasons:

1. The article highlights the exaggerations, tricks and outrages of the so-called “ecology of chaos” which affirms that ecosystems and their dynamics lack any order or stability, since it shows that ecological systems are not aggregates or series at all completely disordered or random events. The text is a good example of how ecosystems and ecological processes are organized and have a structure, an order and a certain stability. And for that alone it deserves to be published and read.

2. The article actually goes beyond the mere structure of ecosystems, showing that there are a number of basic rules common to the architecture of complex systems in general. And this is something very interesting and inspiring for those interested in eliminating the techno-industrial system due to its inevitable incompatibility with the preservation of what remains of Wild Nature on the face of the Earth. It is common to hear many people say that the techno-industrial system cannot be destroyed, that it is invulnerable to attack and that talk of ending it is nothing but unrealistic folly. However, complex systems are organized in the form of “small-world” networks, with nodes potentially distributed, making such systems vulnerable to node removal. The authors even explicitly mention technological systems, even giving some concrete examples. To the good understander...

The architecture of nature: complexity and fragility in ecological networks

By JM Montoya, RV Solé, MA Rodríguez¹

Introduction

What does the fragility of an ecosystem depend on? Does the network of interactions between species determine their response to different types of disturbances? How does the extinction of a species affect the rest of the community? Are there species

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more important for the stability and persistence of an ecological system? If so, what characteristics do they share? The search for general and reliable answers to these questions is especially relevant today, in the face of the sixth great extinction in the history of the Earth that we are causing and witnessing. The architecture of nature, the network of ecological interactions, can give us some of the keys to these questions. EO Wilson (1992), in his magnificent book *The diversity of life*, illustrates how disturbances propagate through the ecological web:

Jaguars and pumas in the few intact forests of Central and South America prey on a large number of species, compared to the more selective nature of cheetahs or African wild dogs. When the jaguars and pumas disappeared from the island of Barro Colorado (Panama), due to the reduction in the extension of the tropical forest, the population of their prey multiplied by ten. Most of these prey have a preference for large seeds from the forest canopy. Other tree species whose seeds are too small to interest these animals benefited from the lack of competition. After a few years, the composition of the forest changed in their favor. The animal species specialized in the seeds of these trees increased their populations, as did the predators that fed on these animals, the fungi and bacteria that parasitize these trees from small seeds and the animals that disperse them, the microscopic animals that they feed on these fungi and bacteria and the predators of these microorganisms; and so through the entire trophic web.

Species relate to each other in different ways, giving rise to complex networks of interaction. Depending on the type of interaction that we observe, we find networks of competitors, trophic networks, mutualistic networks, facilitation networks, etc. The structure of ecological networks conditions many of the functions of the ecosystems that they represent. Nutrient recycling, water and carbon flows, among many other functions, are altered when the architecture of these networks is lost (Schuelze and Mooney, 1994; Levin, 1999). The graphical representation of an interaction network -of its nodes and connections- is called a "graph". Knowing the architecture of ecological network graphs will allow us to answer some aspects of the questions with which we began this article. As we will see, the architecture of these networks presents points in common with other biological and technological networks, which supports the universality of certain organizational and functional principles in complex systems (Solé and Goodwin, 2001). The consequences of these architectures are surprising and entail a new vision of the organization of ecosystems.

Figure 1: (A) Representation of the food web of the terrestrial ecosystem associated with *Cytisus scoparius* in the surroundings of Silwood Park (England). (B) Network with the same number of species and connections but randomly distributed. The points correspond to species and the lines to trophic connections. In (A) some (few) highly connected species can be observed, while the majority have very few connections (many of them only one connection). The disappearance of a highly connected species causes the isolation and, therefore, the extinction of those species that depended only on it for their survival. However, for the random graph (B), the resulting distribution of

connections by species is of the Poisson type. Clearly, the trophic relationships between species in an ecosystem follow a non-random pattern.

Towards a universal architecture of complex networks: the case of food webs

Is there a universal architecture of ecological interactions? Food webs (who eats whom) are the type of ecological web that has received the most attention from ecologists. In the words of Stuart Pimm and colleagues (1991), "food webs are the road maps through Darwin's tangled universe." A food web shows all the possible feeding routes of each of the species that constitute it (**Fig. 1** and **Fig. 2**). Since the pioneering work of Lindeman (1942), a great effort has been made to find regularities between food webs of different ecosystems (for a final compilation, see Williams and Martínez, 2000). For example, in large collections of descriptions of food webs, similar values have been found for many variables, such as the mean number of connections per species, the mean and maximum lengths of food chains, the percentages of basal, intermediate and predatory species, or the percentages of omnivorous or cannibalistic species. However, there has also been great controversy since the publication of an article in 1991 by the recently deceased ecologist Gary A. Polis. In that article, the author indicates that the data from which regularities in trophic networks had been inferred were incomplete, biased and difficult to compare with each other (see Polis, 1991 and Cohen *et al.*, 1993 for the requirements that the data must meet to be valid). Since then, detailed and reliable food webs have been published from which some of these regularities are being corroborated, discarding others and discovering some new ones. And, what is more interesting, a whole field of research is being developed on the response of these systems to different types of disturbances, observing and understanding the direct consequences of disturbances on the network, and the indirect effects that their propagation can cause through it.

Figure 2: *Little Rock Lake food web (Wisconsin, USA). Trophic levels are ordered from bottom to top from the basal level (primary producers, mainly phytoplankton) to the top chain predators (mainly fish). The species (spheres) that have a connection with themselves are considered to be cannibalistic species, and they are relatively abundant (in this network around 14% of the species are cannibalistic, but in the desert network of the Coachella Valley (USA), this percentage reaches just over 60%). Three-dimensional rendering courtesy of Richie Williams and Neo Martínez (San Francisco State University, USA).*

New techniques have recently been developed to analyze the complexity of a large number of natural and technological networks (for a review, see Strogatz, 2001). These techniques have shown that there is a great similarity in the structure and in the response to perturbations of networks of very different types, which points in the

direction of a universal architecture within complex systems. This perspective can constitute a true revolution in Ecology, comparable to the introduction of mathematical models or multivariate analysis.

Figure 3: *Internet. The topology is very similar to that of the food web represented in Figure 1. You can see the most connected nodes, as well as the least connected nodes (What is the node corresponding to Ecosystems like?).*

Networks, whether or not they are ecological, can be represented as a graph $G(N, C)$, where N represents the nodes of the network and C the connections between the nodes. Among others, cellular and metabolic networks have been studied (where N are enzymes or substrates and C metabolic reactions, Jeong *et al.* 2000), the neural network of the worm *Caenorhabditis elegans* (in this case N are neurons and C are synapses, Watts and Strogatz, 1998), networks of social interaction (for example, the network of scientific collaborations, where the nodes are scientists and there is a connection if they have published some joint work, Strogatz, 2001), the Internet, the WWW (Albert *et al.*, 2000, **Fig. 3**) and other technological networks. All these networks share the widely known phenomenon of "small-worlds" (*small-worlds*). Basically, this phenomenon has two manifestations: (1) a very large degree of compartmentalization with respect to what is observed in a network where the connections are randomly distributed among the nodes, that is, in the compartmentalized network there are groups of nodes that are highly connected to each other (small-worlds) but little connected with other groups of nodes; and (2) the minimum number of connections to connect two elements of the small-worlds network is very low and very close to that obtained for a randomly constructed network (for formal descriptions of these measures, see Montoya and Solé, 2001). . In reality, networks with small-world properties are halfway between totally ordered and regular networks and totally random networks.

Why is it so important to know the structure of networks? Simply because structure always affects function. For example, the topology of small-worlds of the Internet facilitates the transmission of information much more efficiently than other types of topologies and, in general, this type of architecture of interactions confers a great capacity of recovery of the systems in the face of disturbances of diverse nature.

This alleged universal architecture is also observed in ecological networks. Two of us have found evidence of this universal small-world structure in the three most species-rich and best-taxonomically described food webs to date (Montoya and Solé, 2001). These networks correspond to the Ythan River estuary, in the United Kingdom (134 species), Little Rock Lake, in the United States (182 species), and the terrestrial ecosystem associated with *Cytisus scoparius* in the surroundings of Silwood Park (England), with 154 species (for more details on the three food webs, see Solé and Montoya 2001). Previous studies carried out by other authors had already suggested that trophic webs tend to be more compartmentalized than would be expected at random, although the measures that had been used in these studies analyzed the trophic similarities between species (that is, the groupings of species that share a certain percentage of prey and predators) (Solow and Beet, 1998). Does the topology of small worlds affect fundamen-

tal properties of the ecosystem, such as its fragility or its persistence? The answer is yes, but let's look at another characteristic aspect of some complex networks, including ecological ones, before delving into it: the distribution of connections between species.

Figure 4: Histograms of total connections (prey to predator and predator to prey) between species for the three food webs analyzed (black bars): (A) Ythan Estuary, (B) Silwood Park, and (C) Little Rock Lake. $P(k)$ indicates the number of species with k connections. The histograms of food webs A and B are appended with the best fit to a power law (white bars). The Little Rock Lake food web has some jumps in distribution (some of them indicated in the figure), probably due to the low taxonomic resolution of some of its nodes (they are not taxonomic species, but groups of species that share prey and predators). The fits with a least squares regression on the log-transformed data are, for the Ythan Estuary (A), $R^2 = 0.83$, $p < 0.01$; for Silwood Park (B), $R^2 = 0.79$, $p < 0.01$;). For Little Rock (C) the adjustment is not significant.

Many networks with small-worlds show a distribution of connections by nodes of potential type. Or, put another way, in these networks there are many nodes with very few connections and very few nodes with a large number of connections. The metabolic networks of many organisms and the Internet are examples of networks that show this characteristic distribution. Two of the aforementioned ecosystems show a potential distribution of trophic connections by species (the Ythan estuary and the Silwood Park subnetwork). And as for Little Rock Lake, although its adjustment is not significant, it does show a distribution with a very long tail (**Fig. 4**). These types of distributions are very different from those in which the connections are randomly distributed throughout the network, which results in a Poissonian-type distribution (**Fig. 2**).

The networks with small-worlds that also have distributions of connections by nodes of potential type show a robustness-fragility duality depending on the type of disturbance they suffer. Let's identify disturbance with the successive disappearance of nodes and, therefore, of the connections of these nodes with other nodes within the network. Let's imagine two types of disturbances, a non-selective one that randomly eliminates nodes, and a selective one that affects the most connected nodes within the network. Faced with random elimination, these networks are very homeostatic, that is, they recover the conditions existing before the disturbance. However, given the selective elimination of the most connected nodes, the network appears to be extremely fragile. In the case of the Internet and the WWW (the first system in which this type of response was observed), a random attack had hardly any effect on the structure and function of the network: a very high percentage of nodes could be eliminated without that this would affect the global transmission of information. On the other hand, an attack aimed at removing a very low percentage of the most connected nodes (for example, Google, Altavista, Yahoo, etc.) caused a lack of communication between

² Original title: *The Vanishing face of Gaia*.

previously connected parts of the network in a very effective way (Albert *et al.*, 2000).

Most connected species as “keystone” species

Ecological networks also seem to be very fragile in the face of the elimination of the most connected nodes (species), while they are very robust in the face of the random disappearance of nodes (species). What exactly do we mean when we talk about fragility in this context? To two essential aspects of the structure and function of ecosystems: (1) the loss of biodiversity associated with the elimination of species, and (2) the fragmentation of the network into disconnected subnetworks. Regarding the loss of biodiversity, a good measure of the degree of fragility is secondary extinctions, that is, the extinctions of species that result from the elimination of other species. Specifically, using computer simulations, we have calculated the fraction of species co-extinct in relation to the fraction of species eliminated (f) in the food webs of Ythan, Silwood Park and Little Rock Lake. In this way, we have obtained secondary extinction rates that can be compared between these three ecosystems (**Fig. 5**).

Figure 5: *Extinction rates (fraction of secondary extinctions) in relation to the fraction f of species eliminated, for the networks of the Ythan estuary (A), Silwood Park (B) and Little Rock Lake (C). Red squares correspond to random species removal (virtually no species co-extinct). The circles correspond to the successive elimination of the most connected species, in descending order according to the total number of connections (transparent circles) or the number of connections of each species only as prey (black circles), with the result being very similar for both orders. selective removal. The fraction of eliminated species for which an extinction rate of one-half is reached under the disturbance of the most connected nodes is (a) 0.17, (b) 0.06, and (c) 0.20, respectively.*

The behavior of the three food webs is very similar. By successively eliminating species at random, each network remains connected, not fragmenting into subnetworks. And, what is more relevant, the extinction rates have very low values even when a large number of species have been eliminated. Something very different happens when we successively eliminate the most connected species: the rates of secondary extinctions grow very fast. For example, for the Silwood Park network, the removal of just under 10% of the most connected species (13 of the existing 154) causes all species in the system to disappear. On the other hand, the network becomes fragmented into multiple subnetworks that are disconnected from each other (**Fig. 6**).

This last result could lead us to think that it is the same to have a single network with many species, than to have many small sub-networks with few species each. But, in general, it is not the same. The risk of extinction is much greater in the second case. The main reason is the so-called *bioinsurance effect*. Greater biodiversity increases the probability that an ecosystem will have: (1) species that may respond differently

under different environmental conditions and disturbances; and (2) functional redundancy, that is, species that are capable of replacing the function of an extinct species. Furthermore, the higher levels of biodiversity of an unfragmented network can maintain ecosystem functions. Thus, in the case of a fragmented network with few species, many of these functions could be quite altered (Schuelze and Mooney, 1997; Levin, 1999; McCann, 2000).

We can conclude that the most trophically connected species in an ecosystem are *keystone species*, since their removal has large effects on the stability and persistence of the network (Bond, 1993). Some previous studies corroborate the key role of the most trophically connected species. Like Wilson's observations that we mentioned at the beginning about jaguars and pumas on the island of Barro Colorado, Owen-Smith (1987) mentions the effects that the extinction of large herbivores has had on different ecosystems, bringing with it a new distribution of species. vegetation, as well as the extinction of a large number of species. Omnivorous insects with a wide trophic niche decrease the population fluctuations of all their prey, which in their absence fluctuates greatly over time, which can lead to species extinctions (Fagan, 1997). In a work still in preparation on communities of parasitic insects (parasitoids) of other insects, we have observed the stabilizing role of the most connected species (hyperparasitoids) on the base resource (the herbivorous insect that produces galls on a plant). In these communities, the rate of parasitism on the herbivore is lower the greater the number of connections of the hyperparasitoids, thus guaranteeing the persistence of the base resource and, therefore, of the entire community. These networks also show an architecture of their connections of the small-world type. From a more theoretical level, through the construction of food webs on a computer, we have also observed the effects of the elimination of species on the insect community in terms of secondary extinctions. The main result is that the elimination of generalist species that prey and are preyed on by more species triggers a greater number of extinctions of other species.

Figure 6: *Fragmentation of a network (with small-world topology and potential distribution of connections) into subnetworks as the fraction of species f removed by increasing (A) a selective attack directed at the most connected species and (B) by a non-selective attack eliminating species at random. The radius of the circles reflects the number of species contained in each subnetwork. The blue circle refers to the largest group of species with ecological viability (there is at least one basal species in the food chain). Random removal of species allows the network to stay connected (small circles are the species we have removed and some other species that coextinct) (B), while for a very small fraction of highly connected species removal, the ecosystem is fragmented into several subnetworks disconnected from each other (A). The risk of extinction of other species increases the more fragmented the network is (see text).*

Under this definition of a keystone species, it is the topology of the network rather than the trophic position of each species that determines which species are keystones. Thus, not only large predators should be considered as keystone species, but also species belonging to other trophic levels (Bond, 1993). Consistent with this, we have found that

keystone species in the Ythan, Silwood Park and Little Rock Lake food webs belong to different trophic types (Solé and Montoya, 2001). In the Ythan estuary network, keystone species are mainly intermediate species (fish and invertebrates, 60%), some predators (birds, 20%), the rest being parasites. For the Silwood Park network, most of the key species are herbivores (66%), which can be considered basal species as there is only one plant as a resource (*Cytisus scoparius*). The omnivorous Hemiptera are also very important (26%). In the case of Little Rock Lake, no basal species is among the most connected, with intermediate species of zooplankton and benthic invertebrates (70%) and predators (such as fish, 24%) being the most connected.

The sixth extinction

Some of the most widespread anthropogenic disturbances with the greatest effects on biodiversity loss mainly affect the most connected species in an ecosystem. The process of habitat destruction and fragmentation provides one of the most obvious cases. It has been observed that this process is especially detrimental to large herbivores and predators with a diet based on a large number of prey (see the example of the disappearance of jaguars and pumas due to the fragmentation of the tropical forest with which this review begins). . The vast majority of species hunted intensively by humans throughout the Pleistocene were highly connected species whose extinction led to changes in ecosystem structure and a large number of secondary extinctions (Owen-Smith, 1987). Another type of disturbance, with less clear effects on more connected species, but with some well-documented examples, is the invasion of alien species. In some cases, it can also primarily affect those highly connected species within an ecosystem (Drake *et al.*, 1989). The protection of the most connected species, through a minimization of the disturbances that affect them, would be a guarantee for the persistence of the ecosystems of which they are part.

Many of the species considered to be at greatest risk of extinction are key species from the trophic point of view in different ecological systems. Species do not interact randomly within ecosystems, but rather according to a certain complex architecture resulting from ecological succession (with small-world properties and potential distributions of connections between species). This architecture is shared by other biological systems (including social ones) and man seems to have imitated it (consciously?) in the design of multiple technological systems. This structure gives a great homeostasis to ecosystems in the face of random, predictable disturbances, which can cause the random disappearance of some species. Due to this architecture, random disturbances will mainly cause the loss of poorly connected species, which will have, in general, little impact on the ecosystem. It seems that throughout evolution this is what has mainly happened: the extinction of species has had a very large random component, as shown by the patterns of extinction deduced from fossil records, not favoring or harming species or groups. of specific species (Raup, 1991; Solé and Goodwin, 2001).

But there have also been five mass extinctions, where the loss of biodiversity of families and genera was enormous (Solé and Newman, 2001, **Table 1**). The origin of these mass extinctions can be some extraordinary agent, such as the fall of a large meteorite or intense volcanic activity, but in some cases it is not necessary to go to these catastrophic external events to explain the existence of a great extinction. A small disturbance could mostly affect key species (those most connected, for example), triggering a whole series of extinction cascades through the web of ecosystem interactions, resulting in the high extinction rates inferred from the fossil record. (Solé *et al.*, 1997).

More and more studies suggest that the biosphere is immersed in a new great extinction (Leakey and Lewin, 1997). In this case, the cause is clearly internal: disturbances of anthropogenic origin that are essentially unpredictable for the ecosystems that suffer them, many of them affecting key species. Current estimates of extinction rates, even those that are more optimistic, attest to the devastating magnitude of this process. All of these estimates are based on statistical species-area ratios combined with estimates of predictable declines in the planet’s habitats (May *et al.*, 1995). A recent compilation of several field studies reveals that extinction cascades are occurring in food webs of different nature. The reduction of the population size of a species, or its extinction, triggers variations in the population sizes of other species within the food web that, in many cases, also lead to its extinction, and so on with more and more secondary extinctions. The machinery for this domino effect is often driven by human-caused disturbances (Pace *et al.*, 1999). Consideration of secondary extinctions and other indirect effects could aggravate the panorama of loss of biodiversity and functionality of ecosystems, increasing current estimates of extinction rates.

Extinction | *Loss of genres*
(observed) | *Loss of species*
(estimated) |

Late Ordovician (440 Ma)	60%	85%
Late Devonian (360 Ma)	57%	83%
Late Permian (250 Ma)	82%	95%
Late Triassic (210 Ma)	53%	80%

Late Cretaceous (65 Ma)	47%	76%	Table 1. <i>Extinction rates of genera and species in the five great extinctions throughout the Phanerozoic at the level (Ma indicates how many million years ago it occurred, data de Jablonsky 1991 and Solé and Newman, 2001). Estimates of extinctions at the genus level come directly from analysis of the fossil record, while species loss is inferred from a technique called "reverse rarefaction" widely used in paleontology.</i>

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Presentation of “Let’s protect what remains of wild nature[”]

As usual in this section, the interest of the following article lies almost exclusively in that it is useful as a source of data about the impact caused both by human beings in general and by the techno-industrial civilization in particular on wild Nature. When questioning the techno-industrial society, it is important to base oneself on facts, that is, on reliable empirical data. For this, scientific studies are very useful and must be taken into account.

However, this type of study is practically never exclusively scientific and ideologically neutral, since its authors are human beings immersed in a specific social and cultural environment and this almost invariably tends to influence their work and create biases. And, again, as usual in this section, this text is no exception to the above.

The two most notable ideological biases and defects of the article would be:

- The fact of proposing coordinated political action within the framework of large international organizations as the only possible solution. Proposals to create international organizations (alliances, organizations or world governments) that regulate and manage certain problematic human activities at a global level are a typical topic in the scientific literature of the last century and, in the majority of scientists who propose it as a strategy, denotes his ingenuity, simplicity and ignorance about practically all those issues that fall outside his reduced field of scientific study (other scientific disciplines, politics, the functioning of the techno-industrial system, morality, human nature, history, etc.). Proposing the reform of the international political framework as a solution is indicative of the uncritical assumption (and probably largely unconscious) by these scientists of a series of values and conventional ideological schemes. Basically, the continuity and perpetuation of the techno-industrial civilization is assumed as a “natural”, immovable and unquestionable fact, adjusting all the strategic suggestions to this fact: the solution to global problems must be sought within the framework of the techno-industrial system, respecting it, and considering it as an unavoidable part of the solution instead of as the cause of said problems, which is what it really is.

In addition, by now it should have become clear to us that international coordinated action by large organizations in the face of global problems and threats does not usually work. We will not enter here to analyze in detail the reasons for its habitual inefficiency. But, whether it works or not, just the fact of proposing that large

international organizations manage global crises should be something that makes us suspicious. Large organizations, especially those of a global nature, often represent the opposite of the freedom and autonomy of individuals, small groups and Nature and the arrogant humanist and progressive dream of achieving a "world government" that controls the whole of the planet (for the good of humanity and/or the planet itself) is the final logical conclusion to which world history has been pointing for thousands of years, a logical conclusion that does not bode well for the autonomy of the wild .

On an even more practical level, how will such large organizations manage to control and manage such a complex and inherently unpredictable/uncontrollable system and processes as the global politics, economy and ecology (and the interaction between them)? Could it not happen (as in fact usually happens) that in the end the remedy is even worse than the disease, that what ends up happening is that, trying to manage the problems on a global scale, the impacts, the disturbances and subjugation that wild Nature already suffers? Because complex systems and processes are largely inherently unpredictable and thus uncontrollable, but the impossibility of accurately and effectively controlling them does not imply the impossibility of disrupting and destroying them. In fact, when you get caught up in them trying to control them, the result is often a disaster, with serious disruptions to those systems and processes, the aggravation of existing problems, the appearance of new ones, and an increase in general disorder.

And, even leaving aside the impossibility of effectively predicting and controlling complex dynamic systems, the control of such systems by international organizations would inevitably entail the need for highly advanced technology (as much as or more than currently exists) and with it of a techno-industrial system, which are precisely the causes or aggravators of the ecological problems that are intended to be solved. It would simply be like pouring gasoline on the fire to try to put it out. An absurd.

The real solution is not to increase control and management at the international level, but precisely to question the existence and necessity of the techno-industrial system and the technological and social development that have led us to this situation .

- Closely related to the above, would be the inclusion "with a shoehorn" in the article of the notions of social justice (in the form of indigenismo in this case) and sustainable development. This is an example of the progressive plague plaguing the vast majority of thought and action on ecological issues today.

It seems that many people feel bad (guilty?) if they do not mention these humanistic issues when talking about ecology, as if the dogma of political correctness forces them to always talk about human (social) issues, whether it comes to the case or not, and as if focusing exclusively on ecological issues were an unforgivable taboo. But the fact is that in reality the defense of social justice has nothing to do with the conservation of the wild character of Nature and artificially mixing both issues is not only an ideologically induced fallacy but also a serious strategic error with serious negative consequences for the preservation of the wild.

More specifically, the insinuations made in the text about the alleged inherently conservationist character of indigenous peoples and the alleged direct relationship between respecting their rights to property of the lands they traditionally inhabit and the conservation of said territories, are simply false. and they are dictated by the liberal cultural and political convention prevailing in the social environments of the authors, not by good sense, science and empirical facts. Have there not been indigenous peoples who caused damage to the ecosystems that they traditionally occupied? And how does the fact that they have legal ownership of their territories prevent them from harming them themselves?

What will prevent them, if necessary, from selling or renting their lands so that they can be exploited industrially? In fact, there are cases of the latter.[a] Simply, when in a text on the preservation of Nature the property rights of indigenous people are identified with the conservation of ecosystems, they are confusing the ass with the storms.

And the same can be said of the habit of including the defense of the paradoxical notion of “sustainable development” in this type of text. It obeys purely ideological, social, and cultural imperatives rather than logic, facts, science, or mere common sense. Development, social and technological, is the ultimate cause of ecological problems, not their solution and, therefore, “sustaining” it will only lead to the perpetuation and aggravation of these problems. Developing indigenous or marginalized communities will not actually protect “the [traditional and supposedly conservationist] ways of life of indigenous peoples”, but will seriously and inevitably alter them. And even less will it reduce the ecological impact, but rather it will increase it on a global scale (and surely even on a local scale as well).

In addition to these two main defects, it is also worth drawing attention to two other much more specific errors:

- The area currently protected by the US Wilderness Act of 1964 is much larger than the 37,000 km¹ mentioned by the authors in the text (this was the originally protected area). According to *Wikipedia*, in 2015 there were 443,175 km². [b] Despite what has been said above about the usefulness of this text as a data source, this error casts doubt on the accuracy and reliability of the information considered by the authors in this text.

- In the box “What remains?”, the “changing conditions of the Anthropocene” are discussed, thereby tacitly assuming the validity of the “Anthropocene” theory and, with it, the main premise on which said theory is based. concept: that currently the human being dominates the entire Earth and that wild Nature no longer exists on this planet [c]. However, the map that appears in that same a For example, years ago some Kayapó groups in Brazil allowed some logging, hydroelectric and mining companies to

¹ Original title: *The Vanishing face of Gaia*.

² Original title: *The Vanishing face of Gaia*.

exploit their territories in exchange for financial compensation. See: “Kayapo courage”, *National Geographic*, January 2014:

[<https://www.nationalgeographic.com/magazine/2014/01/kayapo-courage/>][<https://www.nationalgeographic.com/magazine/2014/01/kayapo-courage/>.] (There is a Spanish version : “The value of the Kayapó tribe” *National Geographic*, March 7, 2014 (updated October 19, 2019):[https://www.nationalgeographic.com.es/mundo-ng/grandes-reportajes/el-valor-de-los-kapayo_7912/1][https://www.nationalgeographic.com.es/mundo-ng/grandes-reportajes/el-valor-de-los-kapayo_7912/1][https://www.nationalgeographic.com.es/mundo-ng/grandes-reportajes/el-valor-de-los-kapayo_7912/1][https://www.nationalgeographic.com.es/mundo-ng/grandes-reportajes/el-valor-de-los-kapayo_7912/1]). See also: William R. Long, “How Gold Led Tribe Astray : The Amazon’s Kayapo Indians traded the wealth of their land for cars, plans and money. Now Brazil has shut off the tap, leaving them with an undermined culture and devastated homeland”, in *Los Angeles Times*, August 29, 1995: [<https://www.latimes.com/archives/la-xpm-1995-08-29-mn-40021-story.html>][<https://www.latimes.com/archives/la-xpm-1995-08-29-mn-40021-story.html>].

Other examples: Eskimos who sell the meat of animals they hunt on their land: [<https://www.cbc.ca/news/canada/north/inuit-hunting-market-cultural-betrayal-or-necessity-1.2616577>][<https://www.cbc.ca/news/canada/north/inuit-hunting-market-cultural-betrayal-or-necessity-1.2616577>][<https://www.cbc.ca/news/canada/north/inuit-hunting-market-cultural-betrayal-or-necessity-1.2616577>][1.2616577;] and Australian Aborigines who lease their land to oil companies: [<https://www.clc.org.au/articles/info/mining-and-development>][<https://www.clc.org.au/articles/info/mining-and-development>].

[b] See:[https://en.wikipedia.org/wiki/Wilderness_Act][https://en.wikipedia.org/wiki/Wilderness_Act].

[c] From this premise, the promoters of the Anthropocene theory draw the conclusion that there is no longer Nature to preserve and that we should accept and even applaud human domination over the planet. See, for example: Ned Hettinger “Valuing the natural character in the Anthropocene” [<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/valorar-el-carcter-natural-en-el-anthropocene>][<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/valorar-el-carcter-natural-en-el-anthropocene>]. box is actually a refutation of said premise: according to the map itself, 23% of the emerged lands remain unaltered and 13% of the oceans. The authors, like many other people concerned with the wild today, should think twice before carelessly assuming and promoting the cunning and dangerous concept of the Anthropocene.

Let’s protect what remains of wild nature[d]

By James EM Watson, James R. Allan, and colleagues.

A century ago, only 15% of the earth’s surface was used for farming and raising livestock.³ Today, more than 77% of the earth’s surface (excluding Antarctica) and 87% of the oceans have been modified by the direct effects of human activities.[2,3] This is reflected in our global map of intact ecosystems (see “What’s left?”).

Between 1993 and 2009, an area of wild terrestrial ecosystems[e] larger than India—an impressive 3.3 million square kilometers—disappeared due to settlement, farming, mining, and other forms of human pressure.⁴ In the oceans, the areas that are still free of industrial fishing, pollution, and shipping traffic are almost completely confined to the polar regions.⁵

Numerous studies are revealing that the Earth’s remaining wilderness[f] ecosystems are increasingly important buffers against the effects of climate change and other shocks. However, for the time being, the contribution in the form of protecting intact ecosystems has not been an explicit objective in any international political framework, such as the United Nations Strategic Plan for Biodiversity or the Paris climate agreement.

This has to change if we want to prevent the Earth’s intact ecosystems from disappearing completely.

Last chance

In 2016, we led an international team of scientists to map the world’s remaining wild[g] ecosystems.[3,4] Earlier this year, we created a similar map for intact ocean ecosystems (see sidebar “Land

ecocentric-theory/value-the-natural-character-in-the-anthropocene), or Brandon Keim “the Earth is not a garden” [<https://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/la-tierra-no-es-un-jardn>][(<https://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/la->)[<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-tierra-no-es-un-jardn>][[tierra-no-es-un-jardn](https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-tierra-no-es-un-jardn))], in *Indomitable Nature* .

[d] Translation by Último Reducto of “Protect the last of the wild”, originally published in *Nature*, Vol. 563, November 1, 2018. *N. from t.*

[e] “Terrestrial wilderness” in the original. “Wilderness” is an English term that refers to natural areas with little or no humanization in which non-artificial processes pre-

³ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

⁵ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

dominate. Its translation in Spanish can vary depending on the context, from "wild ecosystems" in particular to "wild nature" in general, passing through "wild zones or areas" or "wild lands". In this text, unless explicitly stated otherwise, it will be translated as "wilderness areas" or "wilderness areas". *N. from t.*

[f] "Wilderness" in the original. *N. from t*

[g] *Idem. N. of the t. wild*).⁶ The results of these projects show that the time we have left to safeguard the health of the planet - and human well-being - is running out.

Some conservationists argue that particular areas in fragmented and otherwise degraded ecosystems are more important than undisturbed ecosystems.[6,7] Fragmented areas could provide key services, such as tourism revenue and human health benefits, or be rich in threatened biodiversity. However, numerous studies are beginning to reveal that most of Earth's intact ecosystems perform all sorts of functions that are becoming increasingly crucial.[2,8,9]

Wilderness[h] are currently the only places that contain combinations of species with close to natural abundance levels. They are also the only areas that maintain the ecological processes that sustain biodiversity on evolutionary time scales.⁷ As such, they are reservoirs of genetic information and act as reference areas for attempts to rewild[1780]⁸ degraded land and marine ecosystems.

Various analyzes reveal that wilderness areas increasingly serve as a refuge for species that are receding into landscapes dominated by people.[1782]] In the seas, they are the last regions that still contain viable populations of apex predators, such as tuna, billfish[j] and sharks.⁹

⁶ Original title: *The Vanishing face of Gaia*.

⁷ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

⁸ "Re-wild" in the original. *N. from t.*

⁹ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

Safeguarding intact ecosystems is also key to mitigating the effects of climate change, which makes the refuge function of wild areas especially important. For example, a 2009 study showed that coral reefs in the Caribbean that are subjected to low levels of pollution or fishing pressure recover from coral bleaching up to four times faster than reefs with high levels of both impacts.¹⁰ And a 2012 global meta-analysis revealed that climate change impacts on ecological communities are most severe in fragmented landscapes.¹¹

WILD LAND[k]

Mapping methods

To map the Earth's remaining wilderness, we used the best available data on eight indicators of human pressure at 1 square kilometer resolution. These are: built environments, cropland, grassland, population density, night lighting, rail lines, major highways, and navigable waterways.[3,4] (Data collected in 2009). For our map of intact ocean ecosystems, we have used 2013 data on fishing, industrial shipping traffic, and fertilizer laundering, among 16 other indicators.¹²

We identified as terrestrial or oceanic wilderness those areas that were free from human pressure, with an uninterrupted area of more than 10,000 km¹³ on land.

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Many wilderness areas are critical sinks for atmospheric carbon dioxide. For example, the boreal forest is the most intact ecosystem on the planet and stores a third of the world's terrestrial carbon. And intact forest ecosystems are capable of storing and sequestering much more carbon than degraded ones.¹⁴ In the tropics, slash-and-burn now accounts for 40% of total carbon emissions from above the Earth's surface.¹⁵ In

¹⁰ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹¹ Examples:

¹² Original title: *The Vanishing face of Gaia*.

¹³ Original title: *The Vanishing face of Gaia*.

¹⁴ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹⁵ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

the oceans, seagrass meadows¹⁶ change from being carbon sinks to being significant sources of carbon when they are degraded (for example due to contamination with sediments).

Furthermore, models based on geography, rainfall, level of deforestation, etc. they are beginning to show the extent to which wilderness regulates climate and hydrological cycles - locally, regionally and globally. These areas also provide buffer against extreme weather and geological events. Tsunami simulations, for example, indicate that healthy coral reefs offer at least twice as much protection to coastlines as degraded ones.¹⁷

The Wilderness[m] is home to some of the most politically and economically marginalized indigenous communities on Earth. These peoples (with a population of hundreds of millions) depend on intact marine and terrestrial ecosystems for resources such as food, water, and fiber.¹⁸ Many of them have established biological and cultural links with their environments over millennia. Securing wilderness is vital to reducing their poverty and marginalization - and to achieving many of the UN's Sustainable Development Goals, from reducing inequality to improving human well-being.

GLOBAL OBJECTIVES

We believe that the remaining wild ecosystems[n] on Earth can only be protected if their importance is recognized within international political frameworks.

Currently, some wilderness areas are protected by national legislation such as the US Wilderness Act of 1964[o], which protects 37,000 km¹⁹ of federal land. However, in most countries, these areas are not formally defined, mapped or protected. And there is nothing that obliges countries, private industry, civil society or local communities to consider its conservation. What is needed is the establishment of global goals within existing international frameworks - above all, those aimed at conserving biodiversity, avoiding dangerous climate change and achieving sustainable development.

There are several ways to do this out-of-the-box. The capacity of wildlands[p] for carbon sequestration and storage could be formally documented and the importance of conserving them could be included among the policy recommendations of the UN

¹⁶ Marine vascular plants of the order Alismatales. *N. from t.*

¹⁷ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁸ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁹ Original title: *The Vanishing face of Gaia*.

Framework Convention on Climate Change (UNFCCC)[q]. This initiative would allow nations to make the protection of wild[r] ecosystems an integral part of their strategy to reduce emissions.

As an example, under the UNFCCC process to reduce emissions from deforestation and forest degradation (REDD+), landowners can be compensated if they leave an area of tropical forest they plan to exploit unclear. However, there are no incentives for countries, private industry or communities to protect crucial carbon sinks, even where no imminent exploitation plans have been detected. This means that there is nothing to stop the slow erosion of these places by small-scale, often unplanned industrial activity. Similar policies are needed to protect other carbon-rich ecosystems, such as seagrass meadows and boreal and temperate forests, especially in developed countries that do not currently receive financial support from the UNFCCC.

This same month, Egypt will host the 14th edition of the Conference of the Signatory Parties to the Convention on Biological Diversity (CBD)[1784]. The signatory countries, international organizations[t] such as the International Union for Conservation of Nature (IUCN)[u], non-governmental organizations and the scientific community will meet in order to work on a strategic plan for the protection of biodiversity starting in 2020. We urge meeting participants to include as a mandatory goal the conservation of wild ecosystems[v] In our opinion, a bold but achievable goal would be to delimit and conserve 100% of all remaining intact ecosystems .

A mandatory global target will make it easier for governments, non-governmental organizations and others, such as the Global Environment Facility[w] (a multinational funding programme, which addresses environmental and sustainability issues) to fund and implement the necessary actions on the ground.

It will also help make possible the implementation of the various conventions that seek to protect biodiversity. For example, officially recognizing the contribution that wilderness areas make to the “outstanding universal value” of certain areas could lead to the declaration of new Natural World Heritage Sites[x].

According to the UN World Heritage Committee[y], Natural World Heritage Sites are currently selected on the basis of their spectacular natural beauty or because they have unique features relating to biodiversity, ecology or geology. Wild ecosystems[z] are related to all of these criteria, but their importance has not yet been explicitly recognized.

Nearly two-thirds of wild[aa] marine ecosystems are found in international waters, beyond the immediate control of countries. The United Nations Committee on the Law of the Sea[bb] is currently negotiating a binding legal agreement for the conservation of the high seas. Keeping Earth’s remaining wild ecosystems from exploitation should be a key component of the new treaty. Setting strict limits on government subsidies to harmful fishing activities will also be crucial in this case; more than half of industrial fishing on the high seas would not be profitable without such subsidies.[1786]

Antarctica is excluded from our maps because it is legally protected from certain forms of exploitation, such as mining, and because the indirect effects of human activ-

ities on this continent are more difficult to measure. However, it is a vital wilderness area that urgently needs protection. The isolation of Antarctica and its extreme conditions have prevented the levels of degradation experienced elsewhere. However, invasive species, pollution, increasing human activity and, above all, climate change threaten its unique biodiversity and its ability to regulate the global climate.

The Antarctic Treaty System Committee for Environmental Protection[cc] has prioritized research and activity aimed at minimizing human impacts in its latest five-year plan. Signatory nations must now commit to implementing measures aimed at reducing human impacts, such as strict biosecurity procedures that minimize the risk of visitors to Antarctica introducing invasive species.

LOCAL ACTION

How can policy changes at the global level be translated into effective action at the national level?

According to our measurements, 20 countries contain 94% of the world's remaining wild ecosystems (if you count what is found in the high seas and in Antarctica). More than 70% is found in just five countries – Russia, Canada, Australia, the United States and Brazil (see sidebar “What’s Left?”). Therefore, the steps these nations take (or fail to take) in limiting the expansion of roads and shipping lanes and stopping large-scale mining, forestry, farming, aquaculture or industrial fishing will be critical.

An obvious intervention that these nations should prioritize is the establishment of those types of protected areas that slow the impacts of industrial activity on the larger landscapes and seascapes.[1787] However, given the scale of wilderness, expanding strictly and compulsorily protected areas will not be enough. Several studies show that stopping industrial exploitation in order to protect the livelihoods of indigenous peoples can serve to conserve biodiversity and ecosystem services just as well as strictly protected areas. Therefore, recognition of the rights of local communities to own and manage their land could be a key way to limit the impacts of industrial activity.[1788]

Mechanisms that allow the private sector to protect wilderness rather than harm it will be crucial. Specifically, the preservation of intact ecosystems needs to be part of the rules for investment and the performance of credit institutions. Especially in the case of organizations such as the World Bank, the International Financial Commission[dd] and regional development banks. Initiatives that allow companies to claim their supply chains are “deforestation-free” (such as on products containing palm oil) should be expanded to help keep more ecosystems intact.

WHAT'S LEFT?

Earth's remaining wildernesses are becoming increasingly important buffers against the changing conditions of the Anthropocene. However, their protection is not an explicit objective in international political frameworks.

THE HUMAN FOOTPRINT

77% of the land (except Antarctica) and 87% of the oceans have been modified by the direct effects of human activities.

THE WILDEST COUNTRIES

Twenty countries contain 94% of the world's wilderness, except for Antarctica and the high seas.

In the oceans, Regional Fisheries Management Organizations (RFMOs)[ee], formed by various countries to manage their shared fishing interests, have effectively closed large areas of the high seas to exploitation. For example, the Northwest Atlantic Fisheries Commission[ff] (a GOCR founded in 1980) has closed more than 350,000 square kilometers of the Atlantic to bottom trawling. The power of the GOCRs could be increased to allow them to create broader and more far-reaching high seas conservation agreements.

Wild places[gg] face the same extinction crisis as species. Similar to what happens with endangered species, the degradation of wilderness areas is essentially irreversible. Research has shown that the first impacts of industry on wilderness are the most damaging[1789] and that once an intact ecosystem has been affected, its many values can never be fully restored again.

As United States President Lyndon B. Johnson noted when he signed the Wilderness Act of 1964, "If future generations are to remember us with gratitude instead of contempt... we must leave them with such a picture of the world. and how it was in the beginning.

We have already lost too much. We must seize this opportunity to safeguard wilderness areas before they are gone forever.

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Presentation of “APPROACHING A CHANGE OF STATE IN THE EARTH’S BIOSPHERE”

Once again, in this section we present a scientific text whose main interest lies in the fact that it serves as a source of data about the degree of impact on Nature achieved by the techno-industrial society. When trying to question industrial civilization based on the damage it causes to ecosystems, it is convenient to rely on something more than mere intuitions or subjective impressions. And for this, science can be very useful, since *in principle* it is the most reliable and objective way of knowing reality. It is not that we think that techno-scientific development should be extolled and promoted (mainly because it *inevitably* entails other forms of social and technological development that are intrinsically harmful to the autonomy of the wild), but since science is there, we can take advantage of its conclusions to combat the techno-industrial society with knowledge of the facts. With due caution, yes; One thing is science, in theory, and quite another what scientists end up doing in practice, which is not always as rational, critical, objective and independent (ie, scientific) as it should be. As we have already said on some other occasion, scientists are human beings who live immersed in a social and cultural environment that very often affects their work, creating subjective and ideological biases. And this article is no exception either.

Below we comment on the most notable defects of this article:

- Belief in the predictability of complex phenomena and processes. The authors, from the beginning, make it clear in the text that they hope that their studies will help “improve biological prediction by predicting critical transitions.” However, paradoxically, they themselves acknowledge throughout the text that such predictability is, to say the least, very limited. Thus, for example, they recognize that many of the ecological effects of human activities can only be known and understood retrospectively and that “by their very nature, changes of state include surprises.” However, the authors, with their stubborn defense of ecological predictability, seem to forget that explaining backwards is not predicting, that “surprise” implies the impossibility of prediction, that predicting on a small spatio-temporal scale is not predicting on a large scale, that predicting at sometimes or in part is not always and completely predictable and that theoretical models are not reality.

- Defense of the control and management of ecosystems and human societies. One might ask: If complex systems are largely inherently unpredictable, why then do the authors (as well as many other scientists and many other apparently rational and intelligent people) continue to believe and promote false promises about the predictability of systems? complex systems and processes such as those that constitute the functioning of the biosphere? The answer is that predictability is essential to be able to exercise control effectively (in the words of the authors of the text: "to manage [changes of state] as best we can" and "improve our management of biodiversity and services ecosystems"). The true goal of these people is to "direct the future of the global ecosystem and human societies" in order to keep their functioning within limits and adjust their reactions to the needs of the techno-industrial system. For this, they first need to be able to predict with a high degree of accuracy these reactions and functioning. But this dream of the global management of ecosystems and human societies is nothing more than that, a dream. Not only because complex systems and processes are largely inherently unpredictable, but also because predicting is not necessarily the same as controlling. Although to be able to control it is necessary to be able to predict, predicting is not enough to be able to control. Even if it were possible to forecast the effects of certain complex processes with sufficient precision, in order to control them effectively and avoid unwanted effects, much more would be needed: technological means, resources, favorable circumstances, etc. Controlling effectively is even more complicated than predicting, so if predicting complex systems and processes is largely impossible, controlling them is even more so. And, again, it is worth asking, why then do these scientists (and many other apparently intelligent people) obsess over defending, promoting and dreaming of the global management of ecosystems and societies? The answer, at least in part, is that there are two ways of understanding science: as merely an efficient method of obtaining reliable knowledge about reality and thus being able to understand it better, or, beyond this, as a tool for solving practical problems. . This last conception of science, typical of engineering, is applied science or technoscience, and is the most common way of understanding science today (for several centuries). And this is obviously also the notion of science that the authors of the article seem to have. According to this notion, in order to be of interest (and thereby obtain public and private support, funds and resources), research must be directed towards practical ends. And for it to efficiently fulfill these practical purposes, it must serve to exert control (in the words of the authors themselves: "the purpose of science and society is to direct the biosphere towards the conditions we desire, instead of towards those that we want). are involuntarily imposed"). And, of course, in the present circumstances, the "practical" is what serves the development and maintenance of the techno-industrial system, normally presented under the more than debatable (although in reality very little discussed) formula: "maintain human well-being". Here is the ultimate reason why studies such as those discussed in the article seek predictability and control of ecosystems and the biosphere: knowing and understanding them is not enough, one must seek an instrumental justification, a practical application to said knowledge. and

understanding, even though doing so patently largely contradicts such knowledge and "understanding" (for example, it is questionable how far these scientists really understand anything if despite science telling them that complex systems and processes are largely inherently unpredictable they continue to strive to improve the predictability and control of such systems "thanks to science").

On the other hand, and regardless of the real impossibility of predicting or controlling, let us not forget how stupid it is to try to combat and control the impacts of technological and social development on ecosystems with even more technological and social development. Because the global control to which the authors aspire would not be achieved, if it could really be achieved, through magic spells and prayers to the Virgin, but with engineering interventions in non-artificial ecosystems and human societies. Have the authors not thought about what the ecological and social effects of these "corrective" actions will be? Or rather, as is often the case, have they preferred to run ahead and ignore these effects until they become apparent?

Finally, it is worth noting the absurdity of the misleading idea of voluntarist "freedom" underlying the phrase "directing the biosphere towards the conditions we desire, instead of those that are involuntarily imposed on us". To begin with, the attempts to control the biosphere and societies are not really imposed by any human will but by the very dynamics and needs of the techno-industrial system. It is not that we want to control the biosphere to impose our conditions instead of Nature imposing hers on us, but rather that the techno-industrial system needs to do so in order to maintain and grow without hindrance. They are not really genuinely voluntary attempts to impose our desires on Nature, but actions that are imposed (more or less subtly) by technological development for its own perpetuation. Of course, this technological imposition is camouflaged under the humanist mystification of "imposing our will" (supposedly free) on Nature. The best way to force someone to do something is to trick them into thinking they are doing it voluntarily. And to continue, many of the effects of such engineering attempts to control ecosystems and human societies are often largely unexpected and unwanted, as well as undesirable, and are equally unintentionally imposed by the very dynamics of the techno-industrial system and its development. As if the artificial conditions that will lead to the maintenance and development of the techno-industrial society, which will be necessary to try to manage the biosphere at a global level, were really voluntarily decided and sought! The idea that social and technological development allows us to be more "free" by allowing us to transgress certain physical limits, avoid certain unwanted non-artificial effects and control certain natural processes or replace them with artificial ones, is one of the biggest and most dangerous delusions of the humanistic mentality and in reality it implies simply replacing the supposed natural impositions with a very real artificial slavery. Any attempt to get rid of natural restrictions and "impositions" inevitably entails replacing them with new artificial restrictions and impositions, in most cases equally unwanted (and which, contrary to what happens with natural ones, we do not even tend to be evolutionarily adapted). The dream of voluntarily interfering (through technological development) in

ecosystems to “break free” from natural constraints and impositions is tremendously misleading, ridiculous and arrogant and only serves to mask and facilitate artificial imposition and technological slavery.

- Another defect of the text is that, as is unfortunately usual nowadays, the authors join the position that affirms that there is no equilibrium in ecosystems (“Biological ‘states’ are neither stable nor in equilibrium; more well, they are characterized by a defined range of deviations from an average condition over a given period of time”). However, as is also usual in those who display this position, they forget the existence of “dynamic balances” or homeostasis (self-regulation) and end up contradicting themselves to a greater or lesser extent. What is ultimately the difference between a dynamic equilibrium and “a defined range of deviations from an average condition over a given period of time”? Actually none. If the variations with respect to an average fluctuate *within a delimited range*, there is an equilibrium, only it is dynamic.

- It is also worth mentioning the exaggeration and simplicity shown by the authors at certain specific points in the text, as this can lead to erroneous conclusions. For example, when they mention that during the transition from the last glacial to the interglacial period, animal biomass went from being dominated by large mammals to being dominated by humans and their domestic animals, they are exaggerating, as this is something that could certainly be said today. today, but that was not yet the case at that time: at that time most human groups were still hunter-gatherers and the human biomass (or that of the domestic animals of the groups that already led a Neolithic way of life) it could hardly surpass even that of wild animals. In this way, the authors imply that the current bulky human presence in much of the planet is comparable to that of the late Pleistocene and early Holocene, when it is clear that things have changed a lot in terms of human presence since then.

On the other hand and curiously, when the authors compare the current changes generated by human activity with those produced during the last glacial-interglacial change, they fall into simplicity by saying that at that time only 30% of the earth’s surface was transformed. , while currently human activities have already modified much of this surface. Actually, that 30% of the surface is only the surface that lost the ice during that transition, but no one should miss the fact that, in reality, the surface that was not initially covered by ice also suffered changes in terms of climate, composition and abundance of species, etc. Therefore, the changes in the Earth’s surface during the last glacial-interglacial transition were not so “small” compared to those generated by current human activities. The differences that certainly exist between the two processes must be based on other criteria.

- Finally, the position of the authors, as expected in people who seek to manage the planet and human societies, is profoundly anthropocentric and focused exclusively on the well-being of humanity. At no time do the authors show signs of considering that non-artificial ecosystems or the biosphere may have value by themselves, and even less that they may have more value than human beings and their societies, but on the contrary, they treat them as a mere a source of resources and a necessary

environment (for the time being?) to guarantee "human well-being" (read actually "the maintenance and development of the techno-industrial society"). This is a really unfortunate perspective in a people who, just because of their training and profession (that is, because of the amount of data they handle about ecosystems and the human impact on them) should be much more aware and willing to value Nature. By herself.

APPROACHING A CHANGE OF STATE IN EARTH'S BIOSPHERE

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Today, humans dominate the Earth, changing it in ways that threaten its ability to sustain us and other species.[1-3] This fact has led to a growing interest in predicting biological responses at all scales, from the local to the global.[4-7]

However, most biological forecasts today are based on projecting recent trends into the future assuming various environmental stresses¹ or using species distribution models to predict how climate changes might alter observed ranges in the present.[8,9] This paper acknowledges that relying on such approaches alone will prove insufficient to fully describe the full range of likely future biological changes, especially since complex interactions, feedbacks, and their effects are difficult to predict and not are being taken into account.[6,8-11]

Especially important are the recent demonstrations that "critical transitions" caused by threshold effects are very likely.² Critical transitions lead to state changes, which abruptly overturn trends and produce unanticipated biotic effects. Although most of the previous work on threshold-induced states has been theoretical or devoted to critical transitions in localized ecological systems over short spans of time,[12-14] planetary-scale critical transitions have also been postulated that operate over time. centuries or millennia.[3,12,15-18] We summarize here the evidence that such critical transitions on a planetary scale have occurred in the biosphere before, albeit rather rarely, and that humans are forcing now another such transition, with the potential to rapidly and irreversibly transform Earth into a state unknown in the human experience.

We can draw two conclusions from this. First, to minimize biological surprises that would have an adverse impact on humanity, it is essential to improve biological pre-

¹ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

diction by anticipating critical transitions that may arise on a planetary scale and understanding how such global pressures cause local changes. Second, as we said in a previous work, to avoid a change of state on a global scale, or at least to manage it as best we can, it will be necessary to influence the root causes of global change caused by human beings and improve our management of biodiversity and ecosystem services.[3,15-17,19]

Foundations of the change of state theory

That biological systems can change rapidly, at many scales, from a pre-existing state to a radically different state is now well documented.³ Biological "states" are neither stable nor in equilibrium; rather, they are characterized by a defined range of deviations from an average condition over a given period of time. The change from one state to another can be caused by either a "threshold" effect[#bookmark23] or a "sledgehammer"[#bookmark24] effect. Los cambios de [a]Translation by Último Reducto of "Approaching a state shift in Earth's biosphere", *Nature*, vol. 486, June 7, 2012 © 2012 Macmillan publishers limited. *N. from t.*

[b] "Threshold' effect" in the original. *N. of the t.*

[c] "Sledgehammer' effect" in original. *N. of t.* state that are a consequence of threshold effects can be difficult to predict, since the critical threshold is reached by accumulating incremental changes and the threshold value is usually not known in advance. Conversely, a state change caused by a sledgehammer effect - for example, bulldozing a forest - is not something that catches us by surprise. In both cases, the state change is relatively abrupt and leads to new average conditions outside the fluctuation range of the previous state.

Threshold-induced changes of state, also called critical transitions, can be the result of "bent branches"[#bookmark27] and can exhibit hysteresis.⁴ The net effect is that once a critical transition occurs, it is extremely difficult or even impossible for that system to return to its previous state. Critical transitions can also be the result of more complex bifurcations, which are different in character from folded bifurcations but also involve irreversible changes.⁵

Recent theoretical work suggests that changes of state due to folded bifurcations are likely to be preceded by general phenomena that can be described mathematically: a slowdown in recovery from shocks ("critical slowdown"), an increase in pattern variance of within-state fluctuations, increased autocorrelation between fluctuations, increased asymmetry of fluctuations, and rapid changes between states in both direc-

³ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

⁴ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

⁵ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

tions (“oscillations”).[12,14,18] These phenomena can theoretically be assessed within any temporally and spatially delimited system. Although such assessment is not yet straightforward,[12,18,20] critical transitions and in some cases their warning signs have been revealed in various biological investigations,⁶ such as when assessing the dynamics of outbreaks of diseases,[22,23] of populations⁷ and lake ecosystems[12,13]. Impending state changes can sometimes be determined by setting the parameters of relatively simple models.[20,21]

In the context of predicting biological change, it is very important to realize that critical transitions and changes of state can occur both at global[3,12,15-18] and smaller scales. A key question is how to recognize a global state change. Another is whether global-scale changes of state are the cumulative result of many smaller-scale events originating in local systems, or instead require global-level pressures that first arise on a planetary scale and then descend on a planetary scale. to cause changes in local systems. Examining past global state changes gives us useful insights to understand both problems.

Hallmarks of state changes on a global scale

The terrestrial biosphere has already undergone changes of state in the past, over various (usually very long) time scales, and therefore may do so in the future (Box 1). One of the most recent and fastest planetary changes of state was the transition from the last glacial period to the present interglacial state,[12,18] which took millennia to occur.⁸ Ice age conditions had prevailed for ~100,000 years. Then, in ~3,300 years, with intermittent episodes of abrupt climatic oscillations lasting decades, interglacial conditions were fully achieved. Most of the biotic change -which included extinctions, alterations in diversity patterns, and new

⁶ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

⁷ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

⁸ “Chipmunks” in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

[d] “Fold bifurcations” in the original. N. del t. community compositions - happened over a 1,600-year interval, beginning ~12,900 years ago. The ensuing interglacial state we now live in has prevailed for the last ~11,000 years.

There are events that occur on larger time scales, as happened with at least four of the “Big Five” mass extinctions,⁹ each of which constituted a critical transition that lasted between several tens of thousands of years and 200,000 years and changed the course of life’s evolution relative to what had been normal for the previous tens of millions of years. Planetary changes of state can also substantially increase biodiversity, as occurred for example in the “Cambrian explosion”,¹⁰ but these transitions require tens of millions of years, time scales that are not significant when it comes to predicting changes. biological events that may occur during the next human generations. (Box 1).

Despite their diverse time scales, the critical transitions of the past occurred very rapidly relative to their pre- and post-states: for the examples discussed here, the transitions took less than ~5% of the duration of the prior state (Box 1). The biotic hallmark for each change of status was, during the critical transition, a pronounced change in global, regional, and local species groupings. Species that were previously dominant declined or became extinct, new consumers became important both locally and globally, organisms that were previously rare proliferated, food webs were modified, geographic ranges were reconfigured, and new species emerged as a result. biological communities and evolution took new directions. For example, during the Cambrian explosion, large mobile predators became part of the food web for the first time. Following the K/T extinction, herbivorous mammals replaced the large herbivorous archosaurs. And during the transition from the last ice age to the interglacial period, the biomass of megafauna went from being dominated by many species to being dominated by *Homo sapiens* and our domesticated species.¹¹

All of the global state changes noted above coincided with global-scale pressures that changed the atmosphere, oceans, and climate (Box 1). These examples suggest that changes of state on a global scale required pressures on a global scale, which in turn initiated changes of state at lower levels that local controls could not override. Therefore, the crucial aspects of biological prediction would be to understand if the current global pressures are of a sufficient magnitude to cause a critical transition on a global scale, as well as to be able to determine the extension of the changes of state to levels less than those global pressures may have already caused or may cause.

⁹ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

¹⁰ “Sweat lodge” in the original. *N. from trans.*

¹¹ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

Current pressures on a global scale

Today the pressure mechanisms on a global scale are the growth of the human population with its corresponding consumption of resources,¹² the transformation and fragmentation of habitats,¹³ the production and consumption of energy[28,29] and the climate change[3,18]. All of these far exceed, in both timing and magnitude, the detectable pressures that occurred during the most recent change of state on a global scale, the last glacial-interglacial transition (Box 1). This transition is a particularly relevant point of reference when comparing the two pressures on a global scale -climate change and the growth of the human population[27,30]- that took place at that time and which are also very important pressures today. During the last glacial-interglacial transition, however, these pressures probably acted separately, although they coincided in time. Conditions today are very different because pressures on a global scale, including (but not only) climate change, have arisen as a direct result of human activities.

The growth of the human population and the rate of consumption per capita underlie the rest of the causes of global change. Human population growth today (~77,000,000 people per year) is three orders of magnitude higher than the average annual growth for the period ~10,000 years ago to 400 years ago (~67,000 people per year), and In the past century alone, the human population has almost quadrupled.[31-33] The most conservative estimates suggest that the population will grow from its current value of 7,000,000,000 to 9,000,000,000 in 2045¹⁴ and to 9,500,000,000 by 2050[31,33].

Critical transitions and past state changes

Last glacial-interglacial transition.[18,24] The critical transition was a rapid fluctuation of climate, from cold to warm, between 14,300 and 11,000 years ago, with the most pronounced biotic changes occurring between 12,900 years ago and 11,300 years.[24,27,30,54]

The main biotic changes were the extinction of about half of the large mammal species, several large bird and reptile species, and a few small animal species;¹⁵ a significant decline in biodiversity at local and regional levels. as geographic ranges changed

¹² Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

¹³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

¹⁴ "National forests" in the original. *N. from trans.*

¹⁵ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

on an individual basis, resulting in new species assemblages;[37,49,53,54] and a global increase in human biomass, along with the expansion of humans by all continents.¹⁶

The pre-transition global state was an ice age that lasted about 100,000 years, and the post-transition global state is the interglacial that the Earth has been in for about 11,000 years. Global pressures were cyclical variations in solar radiation reaching the Earth induced by changes in the Earth's orbit, which caused rapid global warming. Direct and indirect effects caused by humans likely contributed to the extinction of megafauna and subsequent ecological restructuring.

The “Big Five” mass extinctions.¹⁷ The respective critical transitions ended ~443,000,000, ~359,000,000, ~251,000,000, ~200,000,000, and ~65,000,000 years ago. Each of them is thought to have taken at most 2,000,000 years to complete, but they may have been much shorter; the limitations of geological dating prevent greater precision. The most recent transition (the K/T extinction, which occurred in the late Cretaceous period) may have been the catastrophic result of a meteorite impact, and could have occurred on a time scale as short as the lifetime of a meteorite. human being.

The main biotic changes were the extinction of at least 75% of Earth's species; a reorganization of global and local ecosystems as previously rare life forms gained hegemony; and the return of biodiversity to pre-extinction levels over hundreds of thousands or millions of years.

The global states before and after the transitions lasted between ~50,000,000 and 100,000,000 years. We have already been in the current global state for 65,000,000 years, in an era known as the Cenozoic or Age of Mammals. All the global pressures corresponded to unusual climatic changes and chemical alterations of the oceans and the atmosphere, especially of the concentrations of carbon dioxide and, in one case, of hydrogen sulfide. Intense volcanic activity appears to have been important in some mass extinctions. A meteorite impact is well documented as the cause of the K/T extinction and has been proposed as a possible cause in some of the other mass extinctions as well.

Cambrian explosion.[26,81] The critical transition began ~540,000,000 years ago and lasted about 30,000,000 years.

The main biotic changes were the evolutionary innovations that gave rise to all the phyla known today; the transformation from a global ecosystem based almost exclusively on microbes to one based on multicellular and complex life forms; and an increase in biodiversity, albeit on a time scale that is too large to be significant in predicting the biological future across human generations.

The pre-transition global state lasted ~2,000,000,000 years and was characterized by microbial life forms, both prokaryotic and eukaryotic. The post-transition global

¹⁶ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

¹⁷ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

state has lasted some 540,000,000 years and we are still in it. The global pressures were the increase in atmospheric oxygen to levels high enough to allow the metabolic processes necessary to support complex, multicellular life forms, and the innovations of large size, predation, and complex locomotion.

As a result of human activities, so many direct pressures have already built up on a local scale that indirect pressures for biological change have arisen on a global scale. Direct pressures include the conversion of $\sim 43\%$ of the Earth's surface to agricultural or urban landscapes, with much of the natural landscape being traversed by roads.[1,2,34,35] This exceeds physical transformation which occurred at the last critical transition on a global scale, when $\sim 30\%$ of the Earth's surface went from being covered by glacial ice to being ice-free.

Indirect pressures on a global scale that have arisen due to human activities include drastically changing the way energy flows through the global ecosystem. An inordinate amount of energy is channeled today through a single species, *Homo sapiens*. Humans appropriate $\sim 20\%$ to $\sim 40\%$ of global net primary productivity (NPP)[#bookmark32][1,2,35] and cause the overall decline in NPP by habitat degradation. The increase in NPP at the regional level through atmospheric and agricultural input of nutrients (for example, nitrogen and phosphorous) is not enough to compensate for the deficit.¹⁸ Second, through the release of energy previously stored in fossil fuels, humans have substantially increased the amount of energy ultimately available to keep the global ecosystem running. This addition does not completely counteract the appropriation of PPN by humans, since the vast majority of this "extra" energy is used to support humans and their domestic species, and the sum of all of them is a large animal biomass that goes far beyond what was typical in pre-industrial times.¹⁹ A decrease in this extra energy allocation, which will be unavoidable if alternative energies fail to compensate for the depletion of fossil fuels, will most likely severely impact human health and economies;[28] as well as diminish biodiversity,[27] since in such a case humans would appropriate even more PPN, leaving less for other species.[36]

The side effects of altering the global allocation of energy involve major changes in the atmosphere and oceans. Burning fossil fuels has increased atmospheric CO₂ concentration by more than a third ($\sim 35\%$) over pre-industrial levels, with consequent climate disruptions, including a higher rate of global warming than occurred in the last shift of state on a global scale.²⁰ Higher CO₂ concentrations have also caused the oceans to rapidly become more acidic, evidenced by the fact that the pH has dropped ~ 0.05 points in the past two decades.[38] In addition, pollutants from agricultural runoff

¹⁸ Original title: *The Vanishing face of Gaia*.

¹⁹ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

²⁰ "Between villages there is a death zone" in the original. *N. from t.*

and urban areas have radically changed nutrient cycles over vast expanses of marine areas.²¹

Already observable biotic responses are vast “dead zones” in near-shore marine zones,²² as well as the replacement of more than 40% of Earth’s once-biodiversity non-submerged areas with landscapes that they contain only a few species of cultivated plants, domestic animals, and humans.[3,40] On a global scale, changes in species ranges, phenology, and abundance are consistent with climate change and transformation of habitats that are taking place.²³ New communities are becoming widespread as introduced, invasive, and cultivated species become integrated into many ecosystems.[42] Not all changes in communities produce reductions in the number of species; At the local and regional scales, plant diversity has been increasing, due to anthropogenic introductions,[42] against the global trend *to the loss of species*.[5,43] No However, it is unknown whether the increase in diversity at

[e] “Global net primary productivity (NPP)” in the original. N. of the t. local level will be maintained or will ultimately decline as a result of interspecies interactions that will occur over time. Recent and projected[5,44] rates of vertebrate extinction far exceed empirically determined background rates.²⁴ In addition, many plants, vertebrates, and invertebrates have sharply reduced their geographic ranges and abundances, to the point that they are threatened with extinction.²⁵ The elimination of key species around the world, especially large predators at higher trophic levels, has exacerbated changes caused by less direct impacts, making ecological networks increasingly simplified and less stable.[39, 45.46]

Figure 1 / Causes of a potential critical transition on a planetary scale.

a, Human beings locally transform and fragment landscapes. **b**, Adjacent areas that are still home to natural landscapes suffer indirect changes. **c**, Local anthropic state changes accumulate so that a high percentage of the Earth’s surface is drastically transformed; the brown color represents approximately 40% of the terrestrial ecosystems that have already been transformed into agricultural landscapes, as explained in ref. 34. **d**, Pressures arise on a global scale due to the accumulation of local human impacts, for example, dead zones in the oceans due to seepage of agricultural pollutants. **e**, Chemical changes occur in the atmosphere and oceans due to the emission of greenhouse

²¹ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

²² Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

²³ 1 mile is approximately 1.6 km. *N. from t.*

²⁴ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁵ In this regard, see also the presentation of “There where man is a visitor” by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

gases from the use of fossil fuels. **f—h**, Pressures appear on a global scale that cause ecological changes even in areas that are far from human population concentrations. **f**, Over the past five decades, beetle infestations have been observed killing coniferous forests (brown trees) caused by seasonal changes in temperatures. **g**, Biodiversity stores, such as tropical rainforests, are projected to lose many species as global climate change causes local changes in temperatures and precipitation, thus compounding other threats that already exist. **g**, cause abnormally high extinction rates. For amphibians, this threat consists of the human-facilitated expansion of the chytrid fungus. **h**, Mount Kilimanjaro's glaciers, which had remained large over the past 11,000 years, are now rapidly melting, a global trend that threatens water supplies in many parts of the world of the main population centers. As the growing human population transforms an ever-increasing surface of the Earth, these changes caused by emerging pressures on a global scale increase dramatically, in turn causing changes of state in those ecosystems that are not directly used by people. Photo credits: EAH and ADB (**a—c**, **e—h**); NASA (**d**).

Looking ahead to the year 2100, models predict that pressures on biota will continue to increase. Resource appropriation and energy use by humans will continue to increase as the global population approaches 9.5 billion people (estimated number in 2050), and the effects will be greatly aggravated if per capita use of resources also increases. Forecasts for 2100 range from a minimum population of 6,200,000,000 (which would require a substantial drop in birth rates) to 27,000,000,000 (if fertility remains at 2005-2010 levels; this population size is not believed to be sustainable; ref. 31), passing through 10,100,000,000 (which would require a continued decline in fertility in those countries that still have fertility above replacement level). Rapid climate change shows no signs of slowing down. Models suggest that, on ~30% of the Earth's surface, the rate at which plant species will have to migrate to keep pace with projected climate change is greater than the rate of dispersal they exhibited when Earth last changed from a glacial to an interglacial climate;²⁶ and that dispersal will be impeded by highly fragmented landscapes. It is predicted that within a century the climates that currently exist in 10-48% of the planet will have disappeared and that it is very likely that on 12-39% of the Earth there will be climates that current organisms have never seen before. experienced.²⁷ The global average temperature in 2070 (or possibly a few decades before) will be higher than it has been since the human species emerged.

²⁶ "Wildness" in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply "wild nature". Here, except where otherwise noted, it has been translated as "the wild character." *N. of t.*

²⁷ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

Expect the unexpected

The magnitudes of both the direct pressures at the local scale and the emerging pressure at the global scale are much greater than those that characterized the last change of state at the global scale and are not expected to decrease in the near future. Therefore, the possibility of a planet-wide change of state in the future appears to be high, although there remains considerable uncertainty as to whether it is inevitable and, if so, at what point in the future it might occur. The clear potential for a planetary change of state greatly complicates attempts at biotic prediction since, by their very nature, changes of state include surprises. Nevertheless, some general expectations can be drawn from the natural experiments offered by changes of state on a global scale in the past. At the time scale most relevant to biological prediction today, the biotic effects observed in the change from the last to the present interglacial (Box 1) led to many extinctions;^[30,49-51] dramatic changes in distribution, abundance and species diversity; and the emergence of new communities.^[49,50,52-54] New patterns of gene flow triggered new evolutionary trajectories,^[55-58] but the time since then has not been long enough to offset extinctions.

At a minimum, one would expect such effects to occur from a global-scale change of state caused by current pressures, not only in regions where humans predominate, but also in remote areas that today they are not heavily occupied by our species (Fig. 1); in fact, such changes are already occurring (see above^[5,25,39,41-44]). Given that it takes hundreds of thousands or millions of years for evolution to rebuild biodiversity to pre-crash levels after major extinction events,²⁸ extinction rates are of particular importance, not least because, as a result of last change of state at the planetary level, global and regional diversity today is less than 20,000 years ago.^[37,50,51,54,59] Due to the homogenization of the world biota caused by the species transported by living beings humans, this large-scale loss of diversity is not offset by historical increases in plant species richness in many individual locations.^[42] Substantial losses of ecosystem services needed to sustain human populations are also possible.²⁹ The extent to which human-caused increases in certain ecosystem services—such as food production—compensate for the loss of “natural” ecosystem services, many of which are already beginning to take dangerous directions as a result of climate change, remains unknown. overexploitation, pollutants, and climate change.^[3,16] Examples include the collapse of fishing grounds for cod and other species;^[45,61,62] the loss of millions of square kilometers of coniferous forest due to climate-induced bark beetle infestations;³⁰ loss of carbon-sequestering capacity due to forest destruction;³¹ and regional losses in agricultural productivity due to desertification or harmful practices in

²⁸ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁹ “Wildness” in the original. *N. from t.*

³⁰ “Self-willed” in the original. *N. from t.*

³¹ “Wildness” in the original. *N. from t.*

the land use.[1,35] Although the ultimate effects of change on biodiversity and species composition are still unknown, if critical yield thresholds were reached With declining improvements in ecosystem services across large areas and at the same time global demands increasing (as will occur if there is a population increase of 2,000,000,000 in about three decades), the results could be widespread social unrest, economic instability and loss of human lives.³²

Towards better biological prediction and control

In view of the potential impacts on humanity, a key need in biological prediction is the development of ways to anticipate a critical global transition, hopefully early enough to do something about it.³³ It is possible to imagine the qualitative aspects of a planetary-scale change of state based on current human impacts (Fig. 1), but criteria that would indicate exactly how close we might be to a critical planetary-scale transition remain elusive. There are three approaches that should be helpful in determining benchmarks and tracking progress towards them.

Track changes on a global scale

The first approach recognizes the fact that state changes at the local scale -whether they are the result of hammer effects or threshold effects- cause critical transitions over regions larger than the directly affected area, as has been shown. empirically and theoretically.[66-70] At the landscape level[#bookmark37], tipping points in undisturbed plots become empirically evident when between 50% and 90% of the plots have been disturbed surrounding. Simulations indicate that critical transitions become much more likely when the connection probability of any two nodes in a network (ecological or otherwise) falls below ~59% (refs. 66-70). More generally, dense human populations, roads and infrastructure, and land transformation are known to cause ecological changes outside of the areas that have actually undergone such hammer-like changes of state.³⁴ Translating these principles to the planetary scale would imply that if a sufficient proportion of the Earth's ecosystems underwent such transformations, the rest could change rapidly (Fig. 2), not least because larger-scale emerging pressures (e.g. in chemistry and in nutrient and energy cycles, in pollution, etc. of the atmosphere and oceans) multiply and interact to aggravate local pressures³⁵ (Fig. 1). How-

³² "Arctic National Wildlife Refuge" in original. *N. from t.*

³³ "Wildness" in the original. *N. from t.*

³⁴ The author refers to the discovery of large geometric figures of earth (geoglyphs) in certain areas of the Amazon basin. See, for example, "Environmental impact of geometric earthwork construction in pre-Columbian Amazonia," John Francis Carson, Bronwen S. Whitney, Francis E. Mayle, José Iriarte, Heiko Prümers, J. Daniel Soto, and Jennifer Watling, in *< em>PNAS*, July 7, 2014. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>][<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>]. *N. from t.*

³⁵ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are

ever, the percentage of the Earth's ecosystems that would have to be transformed into new states by direct human activity in order to cause rapid state changes in the remaining "natural" systems is still unknown. This percentage can only be known retrospectively, but, judging by the observations and simulations made at the landscape level,[#bookmark38][,66-70], it is reasonable to assume that it is not greater than 50% (ref. 68), or even less if the interacting effects of many local ecosystem transformations cause large enough global-scale pressures to arise.

In that context, continued efforts to track changes on a global scale using remote sensing and other techniques will be essential in assessing how close we are to tipping the scales towards an Earth in which most ecosystems have been directly altered by people. This is relatively easy to do for emerged lands and it has already been shown that at least 43% of the planet's terrestrial ecosystems have undergone widespread transformation,[1,2,34,40] which is equivalent to ~ 2 on average .27 acres (0.92 ha) converted per capita for the current human population. Assuming that this average rate of land transformation per capita does not change, 50% of the Earth's non-submerged surface will have undergone changes of state by the time the population reaches 8,200,000,000, which is estimated to happen around the year 2025.³⁶ Making the same assumption regarding land use, although following only slightly less conservative population growth models, 70% of the Earth's land surface could have been transformed for human use (if the population reaches 11,500,000,000) in 2060.³⁷

[f] "On the lanscape scale" in the original. Literally "at landscape scale". In reality there is no consensus as to the extent of the "landscape scale", although it is usually a scale between the local and the regional. N. of the t.

[g] "From lanscape-scale observations and simulations" in original. See footnote above. N. from t.

Figure 2 / Quantification of land use as a method of predicting a change of state at the planetary level. The trajectory of the green line represents a bifurcation folded with hysteresis.[42] In each year indicated, light green represents the proportion of Earth's ecosystems that are likely to maintain dynamics within the limits that have been characteristic for the last 11,000 years. Dark green indicates the proportion of terrestrial ecosystems that have indisputably undergone drastic state changes; these are the minimum values since only agricultural and urban land are taken into account here. In 2011, the percentages of these transformed lands come from refs. 1, 34 and 35, and when divided by 7,000,000,000 (the global human population today) gives a value of approximately 2.27 acres (0.92 ha) of converted land for each person.

descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

³⁶ "National forests" in the original. N. from trans.

³⁷ "National forests" in the original. N. from trans.

This value has been used to estimate the amount of converted land that probably existed in the years 1800, 1900 and 1950, as well as that which will exist in 2025 and 2045 assuming a conservative value for population growth and that resource use is not become more efficient. Population estimates are from refs. 31-33. An estimate of 0.68 acres (0.28 ha) converted per capita (approximately the value for India today) has been used for the year 1700, assuming that before the industrial revolution the overall effect on the landscape was smaller. . The question marks emphasize that at present we still do not know how much land will have to be directly transformed by humans for a planetary-level change of state to be imminent, but landscape-scale studies and theory[[bookmark0](#)][[h](#)] suggest that the critical threshold could be between 50% and 90% (although it could be even lower due to synergies between emerging global pressures). See the main text for a more extensive explanation.

Assessing the rate of change to new states in marine systems, as well as the direct human footprint on the oceans, is much more difficult, but available data suggest wide-ranging effects.[38,39] Given that ocean ecosystems cover the most of the planet, making a more precise quantification of the changes of state in the oceans is an important pending task.

Track local scale changes caused by global pressures

The second approach is the direct monitoring of biological change caused by external pressures in the local systems studied. Such monitoring will be vital, particularly where the human footprint is believed to be small.

Observing unusual changes in these areas, such as has recently occurred in Yellowstone Park in the US, which has been protected since 1872,³⁸ as well as in many remote watersheds,³⁹ would indicate whether larger-scale pressures [38,73] are influencing ecological processes.

A key problem has been how to recognize 'unusual' change, as biological systems are dynamic and changing baselines have given rise to many different definitions of 'normal', each of which can be considered unusual within a specific context. given temporary. However, identifying signs of a change of state on a global scale in a local system would require a temporal context of at least a few centuries or millennia, in order to encompass a range of ecological variation that can be considered normal in the current interglacial period, whose full duration is ~11,000 years. Identifying unusual biotic changes at this scale has recently been made possible by several different approaches, all of which share the trait of focusing on integrating spatial and temporal information (Box 2). These advances include the characterization of ecosystems through the use of taxo-independent indicators that can be detected using paleontological data from pre-anthropoc times and, later, be compared with current conditions and projected into the future; recognition of macroecological patterns that indicate disturbed systems; combining phylochronological and phylogeographic information to track population

³⁸ 1 foot = 30.48 cm. *N. from t.*

³⁹ Rodents of the genus *Dipodomys*. *N. from t.*

dynamics over several millennia; and the study of the structure and stability of ecological networks through the use of theoretical and empirical methods. Since all of these approaches benefit from time series data, long-term monitoring attempts and existing paleontological and natural history museum collections will become especially valuable.⁴⁰

Synergies and feedbacks

Thresholds leading to critical transitions are often crossed when pressures are heightened by the synergistic interaction of apparently independent processes or by feedback loops.[3,16] Given that various pressures are at work on a global scale today, understand how they can be combined to increase biological change is a key challenge.[3,15-17] For example, rapid climate change combined with highly fragmented species ranges would be expected to increase the chances of ecosystem collapse. and that widespread changes in landscapes may in turn influence the biology of the oceans.

Feedback loops also occur between apparently discrete systems operating at different levels in the biological hierarchy[6,8,37] (genotype, phenotype, populations, species distribution, interspecies interaction, etc.). The net effect is that a biological pressure applied at one scale can cause a critical transition to occur at another scale. Examples of this are inadvertent anthropic selection for earlier maturity in cod as a result of heavy fishing pressure;[61] population collapses due to declining genetic diversity;⁴¹ mismatch between the flowering and pollination phenology as a result of the interaction of genetic factors, temperature, photoperiod and/or precipitation;⁴² and cascades of ecological changes caused by the removal of top predators.⁴³ In most cases, these “jumping scale” effects, and the mechanisms that produce them, have only become visible in retrospect, but even so they have become critically important in revealing the effects of interactions. that can now be incorporated into a new generation of biological forecasts.

Finally, since the global-scale ecosystem encompasses many spatially constrained systems at smaller scales (for example, a community within a given physiographic region), each of which overlaps and interacts with others, the state changes of the components on a small scale they can propagate to cause a state change of the entire system.⁴⁴ Our understanding of complexity at that level can be improved by tracking changes within many different ecosystems in parallel, from studies of landscape-scale

⁴⁰ “Pleistocene rewilding” in the original. *N. from t.*

⁴¹ “De-extinction” in the original. *N. of t.*

⁴² “National Public Radio” in the original. It refers to an American radio station. *N. of t.*

⁴³ Norse. *N. from t.*

⁴⁴ “*A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be*

state changes[[bookmark41](#)][12,21] and from the theoretical work that is already being carried out.⁴⁵ However, the potential interactions between complex overlapping systems are proving to be difficult to formulate mathematically, especially when the systems under study are poorly understood and heterogeneous.⁴⁶ In any case, one conclusion that emerges from this work is the possibility that transient long-term behaviors are widespread at the ecosystem level in which, after periods of relative stasis, sudden changes in dynamics can occur even in absence of external forces;⁴⁷ somewhat analogous to the delayed collapse of metapopulations as a result of extinction debt.⁴⁸ This potential “time lag” effect makes it all the more crucial to act as soon as possible, if possible, on global pressures that may push the biosphere as a whole towards a critical transition.

Integrate spatiotemporal data at large scales to detect changes of state at the planetary level

- Paleontology uses historical, fossil, and geological information to gauge normal levels of fluctuation in biodiversity, species composition and abundance,⁴⁹ food webs,⁵⁰ ecomorphology,⁵¹ extinction,⁵² etc. Recent work shows that some lightly populated ecosystems are still functioning within limits that would be considered normal.

[i] “Landscape-scale studies” in the original. See footnote f. N. of the t. for the current interglacial period, but others have been altered.⁵³

- Macroecology offers quantitative ways to identify when a particular ecosystem shows unusual characteristics in indicators such as species-area ratios, species abundance distributions, patterns of spatial aggregation,[84,85] the distribution of metabolic

with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources.” (The revenge of the Earth, page 209).

⁴⁵ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

⁴⁶ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

⁴⁷ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

⁴⁸ “Wilderness” in the original. *N. of t.*

⁴⁹ “Wilderness” in the original. *N. of t.*

⁵⁰ In relation to the concept of “productive landscape” see the article “Why the productive landscape doesn’t work” by George Wuerthner, in *Untamed Nature*:

⁵¹ “Black-footed ferrets” in the original. *Mustela nigripes. N. of the t.*

⁵² “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

⁵³ “Wilderness” in the original. *N. of t.*

rates in individuals in a community,[85,86] the inverse power law of the relationship between abundance and body size⁵⁴ and the distribution of interspecies ties in a trophic web.⁵⁵ Recent advances in formalizing the maximum entropy (EntMax) theory of ecology[85,86] offer a theoretical means of accurately predicting such patterns in unperturbed systems; significant deviations from the Ent Max predictions would be a sign of disturbed systems.⁵⁶

- Population biology uses life histories, abundance, genetics, and numerical models to study population dynamics and viability. Recent advances in obtaining ancient DNA from samples several thousand years old, together with newly developed analytical models that take into account both temporal (phylochronological) and spatial (phylogeographic) patterns, increase the ability to check if the genetic patterns present in the modern landscape deviate from those patterns that emerge on a scale of centuries or millennia.[10,89]

- The theory of ecological networks considers ecosystems as complex networks of species that are connected to each other by different interactions. Recent work identifies the persistent and stabilizing characteristics of networks at different geographic and temporal scales[81,82] (both current and paleontological), such as the ratios between the body sizes of consumers and their resources,⁵⁷ the effects gradual allometrics⁵⁸ and skewed distributions for connectivity,[81,92,93] as well as the strength of interactions[94-96]. Alterations in these characteristics are a sign of disturbance of the normal structure of a network.

Theoretical work is also revealing in cases where information about specific species traits such as body size,[46,90,91] trophic generality,⁵⁹ trophic uniqueness⁶⁰, interac-

⁵⁴ 1 mile is roughly equal to 1.6 km. *N. from t.*

⁵⁵ “It’s these feelings, wilderness-impassioned and modest and respectful” in the original. *N. of t.*

⁵⁶ “Wolverines” in the original. *Gulo gulo. N. from t*

⁵⁷ Ibid.

⁵⁸ Orwell defines freedom in a leftist and humanist framework. According to this, freedom is to be free from natural physical hardships thanks to the blessings of a human society that has subjugated wild Nature, and not being under political pressure, not being exposed to discrimination (class, race, religion, etc.), and with an income that will make it possible to enjoy the blessings of human society.

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⁶⁰ With the developments of computer technology (like machine learning algorithms and ever more powerful processors), the system has also started to target people individually with its methods of enchantment. Contents that are shaped for specific individuals in shopping websites, video streaming websites, etc. are becoming the norm.

tions do not trophic⁶¹ and phylogenetic⁶² information can predict when ecosystem services will degrade as networks become destabilized[46,100] and cleared.⁶³

Steer the biotic future

Human beings have already substantially altered the biosphere, so much so that some say we should recognize that the epoch we live in is a new geological age, the Anthropocene.[3,16,78] Comparing the current extent of change at the planetary level with which he characterized past global state changes, as well as the enormous global pressures we continue to exert, suggest that another global state change is highly likely within the next few decades or centuries, if it has not already begun. .

Consequently, biological resources that we take for granted today may be subject to rapid and unpredictable transformations within a few human generations. Therefore, anticipating biological surprises on both global and local scales has become especially vital in directing the future of the global ecosystem and human societies. This direction will require not only scientific work that predicts, and possibly helps avoid,⁶⁴ the negative effects of critical transitions, but also that society is willing to incorporate the expectations of biological instability⁶⁵ into strategies to maintain human well-being. Reduce the range of biological surprises resulting from both bottom-up (local to global) and top-down (global to local) pressures, postpone their effects, and ideally , avoiding a critical transition at the planetary level requires global cooperation to curb the current pressures on a global scale.[3,15-17,19] This will require reducing the growth of the world population⁶⁶ and the use of resources per capita; rapidly increase the proportion of global energy consumption that is supplied by sources other than fossil fuels, while making more efficient use of these fuels when they are the only available option;⁶⁷ increasing the efficiency of the means of production of food and its distribu-

⁶¹ For the definition and a more detailed discussion of the power process, see: Theodore John Kaczynski, *Industrial Society and Its Future*, paragraphs 33-37.

⁶² Some of them internalize these values so intensely that when they try to rebel against the established order they can't think of anything else and use the system's values to rebel against it. For a more detailed discussion of this subject, see Karaçam, "Leftism, Techno-Industrial System, and Wild Nature" and Último Reducto, "Leftism: The function of pseudo-critique and pseudo-revolution in techno-industrial society".

⁶³ With the developments of computer technology (like machine learning algorithms and ever more powerful processors), the system has also started to target people individually with its methods of enchantment. Contents that are shaped for specific individuals in shopping websites, video streaming websites, etc. are becoming the norm.

⁶⁴ "Wildness" in the original. *N. from t.*

⁶⁵ "Arctic National Wildlife Refuge" in original. *N. from t.*

⁶⁶ "National forests" in the original. *N. from trans.*

⁶⁷ "Impact investing" in the original. It refers to investments, in companies or organizations, theoretically made with the intention of generating a social or environmental benefit apart from economic benefits. *N. from t.*

tion rather than converting new areas[34] or relying on wild species⁶⁸ to feed people; and increase efforts to manage as reserves of biodiversity and ecosystem services, both in terrestrial⁶⁹ and marine⁷⁰ areas, those parts of the Earth’s surface that have not yet been dominated by humans. Admittedly, these are colossal tasks, but they are vital if the purpose of science and society is to steer the biosphere toward the conditions we desire, rather than toward those that are inadvertently imposed on us.

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⁶⁸ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

⁶⁹ “Wilderness” in the original. *N. of t.*

⁷⁰ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

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Quantifying and mapping human appropriation of primary production from the earth's terrestrial ecosystems[i]

Helmut Haberl, K. Heinz Erb, Fridolin Krausmann, Veronika Gaube, Alberte Bondeau, Christoph Plutzer, Simone Gingrich, Wolfgang Lucht, and Marina Fischer-Kowalski

Material flows resulting from human activities have become a very important component of biogeochemical cycles (1). Alterations of photosynthetic production in ecosystems and extraction of the products of photosynthesis by humans, often referred to as “human appropriation of net primary production (PPN)” or AHPPN, have received considerable attention (2-4). NPP is the net amount of carbon assimilated by vegetation in a given period. It determines the amount of energy available to be transferred from plants to other levels in the food webs of ecosystems. The AHPPN not only reduces the amount of energy available to other species (2), it also influences biodiversity (5-8), water flows (9), carbon flows between vegetation and the atmosphere (10,11), energy flows within trophic webs (12) and the provision of ecosystem services (13,14).

Previous studies of NPP extracted to meet human needs and wants or lost due to human-induced changes in ecosystem productivity suggested substantial human impact on the biosphere, thus raising concerns about sustainability (15,16). Previous studies of the global AHPPN did not make full use of available spatially explicit databases (12) and their results were quite mixed (2,5,16,17). The estimate presented here is based on the best available global databases and integrates the dataset into high-resolution geographic information systems (GIS). These data, in combination with a dynamic global vegetation model (GDVG), are used to obtain an overall assessment of the global AHPPN. This study localizes human-induced changes in ecosystems within a 5' geographic resolution grid (~10 km x 10 km at the equator) for the year 2000.

The results of the AHPPN presented here are based on the statistics at the national level (161 countries covering 97.4% of the land globally) from the Food and Agriculture Organization (FAO) about the area and the extraction of biomass in farmland and forests. FAO statistics on livestock have been used to obtain the trophic

balance in each of these countries in order to calculate the amount of pasture biomass that does not appear in the statistics. Potential NPP has been calculated using the Lund-Potsdam-Jena (LPJ) MDVG (18,19), a well-established biogeochemical model for global vegetation processes. Actual NPP has been calculated using extraction indices to extrapolate NPP in cropland from extraction statistics, while the¹ LPJ model has been used in wilderness,[ii] forests and pasture areas. In pasture areas, the effects on NPP of fertilization, irrigation and soil degradation have been explicitly included in the estimation and the results have been compared with the demand for pasture. The NPP consumed in human-induced fires has been calculated in a detailed regional breakdown.

The results of the AHPPN calculations depend greatly on the definition used (2,20,21). We define AHPPN as the combined effect of land use-induced changes in extraction and productivity on the availability of NPP in ecosystems. That is, the AHPPN is calculated as the difference between the PPN of the potential vegetation (PPN0), that is, of the vegetal cover that would prevail in the absence of human intervention, and the fraction of the PPN that remains in the ecosystems after extraction (PPNt). NPPt is calculated by subtracting the amount of NPP removed or destroyed during harvesting (NPPh) from the NPP of the currently predominant vegetation (NPPact) (5, 6). The AHPPN, therefore, is the sum of the APPN_{LC} and the PPNh, where the APPN_{LC} represents the impact on the NPP of the land conversions induced by the activities such as changes in land cover, changes in land use and soil degradation.

Table 1. Global carbon flows related to human appropriation of net primary production (AHPPN) around the year 2000

NPP-related carbon fluxes | NPP total | PPN above the ground surface |

Pg C/a	%	Pg C/a	%
Potential vegetation (PPN0)	65.51	100.0	35.38
Real vegetation (PPN _{act})	59.22	90.4	33.54
			94.8

¹ Translation by Último Reducto of “Quantifying and mapping the human appropriation of net primary production in earth’s terrestrial ecosystems”, originally published in *PNAS* vol. 104, no. 31, July 31, 2007, 12942-12947. *N. from t.*

Human-Induced PPN Alteration (APPNL _C)	6.29	9.6	1.84	5.2

Removal by humans (hPPN)	8.18	12.5	7.22	20.4

Human-Induced Fires	1.14	1.7	1.14	3.2

Remaining ecosystems (PPN _t)	49.90	76.2	25.18	71.2

AHPPN _{total}	15.60	23.8	10.20	28.8

Flows back to nature*	2.46	3.7	1.50	4.2

In situ return flows of extracted biomass to ecosystems, ie unused residues, extraction losses, faeces from grazing animals and roots that die during extraction.

A very important argument in favor of this definition of AHPPN is that changes in agricultural technology can result in considerable increases in PPN_{act} over time (22,23). Therefore, the need to increase extraction does not necessarily result in a reduction in PPN_t. Therefore, it is important to calculate the APPNLC so that technological progress is not overlooked (24). Furthermore, we prefer a definition of the AHPPN that is not too inclusive, taking into account the fact that in reality a considerable fraction of the NPP from grassland and forest plantations remains in the ecosystem and² supplies food energy to their ecological food webs. In order to explore the importance of definitional issues, we have used our database to calculate AHPPN according to the definition given by Vitousek *et al.* (2) and compared the results with those obtained using the definition used here.

Results

Human activities have a substantial effect on the global PPN and the pathways it follows through ecological and social systems. Our calculations show (Table 1) that humans appropriate -15.6 Pg C/a, which represented 23.8% of the global terrestrial PPN₀ in the year 2000. Already Since human beings mainly use the PPN that is produced above the terrestrial surface, from a socioeconomic perspective it is relevant to consider this compartment. Here we find an even bigger impact: the AHPPN above the ground surface was 10.2 Pg C/yr or 28.8% of the PPN₀ above the ground surface. Overall, biomass removal contributed 53% to total AHPPN, land use-induced changes in productivity contributed 40%, and human-induced fires contributed 7%. A considerable amount of biomass included in the PPN_h (16% of the total AHPPN or 3.7% of the PPN₀) immediately returns to the ecosystems in the form of roots that die during extraction, crop residues and wood that remain in place or from cattle faeces and, therefore, it is only available for the food chains of detritivores. Human extraction of biomass alone constitutes -12% of the total PPN₀ and 20% of the PPN₀ above the earth's surface.

We found significant alterations of the PPN as a result of land changes induced by human activities (APPN_{LC}). As can be seen in Table 1, land use has resulted in a cumulative reduction in global NPP of 9.6%, with large regional variations shown in Fig. 1a. Land use does not necessarily reduce NPP. Irrigated land as well as intensively used agricultural areas may have higher productivity than potential vegetation. The spatial distribution of the total AHPPN is shown in Fig. 1b as the percentage of the appropriate PPN₀ in each grid cell. Maps of PPN₀, PPN_{act}, PPN_t and AHPPN in absolute units (g C/m³/a) are available at [<https://drive.google.com/file/>

² "Wilderness" in the original. It refers to areas with little or no humanization. Here it will be translated as "wilderness" or "wild areas." *N. from t.*

³ Original title: *The Vanishing face of Gaia.*

d/1G7hiuKjQB3PZxcoYmVmWwobwpmOAaZQ0/view][*Supplementary Information (IS)*]Figs. 2-5.

The maps depicted in Fig. 1 show where on earth, and with what intensity, humans alter ecological energy flows, thus locating the intensity of human domination of ecosystems. Cropland and infrastructure areas are used more intensely, resulting in mean global values of 83% and 73% of the AHPPN for these areas (Table 2). The AHPPN is much lower in pasture lands (19%) and in forest exploitations (7%). As a global average, areas currently being logged are the most productive, followed by areas currently used as farmland and for infrastructure. The potential productivity of grazing land is lower than that of cropland, reflecting the fact that fertile areas are used for farming rather than grazing cattle, but its productivity is currently slightly higher . This is due to a substantial reduction in productivity (APPNLC) in arable land that can be explained on the one hand by the prevalence of low-productivity agriculture in developing countries and on the other by the low underground productivity of agricultural land. crops (25). Table 2 also shows the low productivity of most of the remaining wild areas.

Extraction per unit area and year is much higher in croplands (296 g C/m⁴/a), which helps explain why crops alone account for 50% of global AHPPN (Table 2), despite its limited spatial extent (12% of the land surface, excluding Antarctica and Greenland). In total, agriculture (crops and pastures) is responsible for 78% of global AHPPN, with the remaining 22% caused by logging, infrastructure, and human-induced fires.

Table 2. Breakdown of the global AHPPN by land use types (excluding human-induced fires) during the year 2000

Land use category | PPNo, gC/m⁵/a | PPNact, gC/m⁶/a | hPPN, gC/m⁷/a | PPNt, gC/m²/yr | AHPPN in this area, % | APPNlc, % | Contribution to
Total AHPPN, % |

Crops	611	397	296	101	83.5	35.0	49.8

Pasture land	486	433	41	392	19.4	11.0	28.5

Logging	720	720	48	673	6,6	0.0	10.6

⁴ Original title: *The Vanishing face of Gaia*.
⁵ Original title: *The Vanishing face of Gaia*.
⁶ Original title: *The Vanishing face of Gaia*.
⁷ Original title: *The Vanishing face of Gaia*.

Infrastructure areas	586	221	63	158	73.0	62.3	3.7

Wilderness areas	229	229	None	229	None	None	0.0

Global or total aver- age	502	454	63	391	22.1	9.6	92.7*	*The re- main- ing 7.3% is caused by human- induced fires (see Table 1).

A regional breakdown of the global AHPPN (Table 3) reveals considerably different patterns in different regions of the world. Total AHPPN can be as low as 11-12% in Central Asia, the Russian Federation and Oceania (including Australia), while land is used much more intensively in other regions. For example, South Asia has a total AHPPN value of 63% and land use intensity is also high in Eastern and Southern Europe (52%). The reduction in productivity induced by land use ($APPN_{LC}$) ranges from 5% in East Asia to 27% in Eastern and Southern Europe.

Discussion

The results presented above show that a considerable part of the global NPP of the land is used to satisfy the needs and desires of only one species, which indicates the degree of use that humans make of the earth's resources. Our AHPPN estimate of 15.6 Pg C/a is slightly higher than the high estimate by Imhoff *et al.* (16) and substantially higher than their intermediate estimates (11.5 Pg C/a) and low (8.0 Pg C/a). Our result is in line with that of Wright (5) and falls completely within the range of results obtained by Vitousek *et al.* (2), according to their different definitions.

Since our results on biomass removals (NPP_h) involve extensive use of international databases and cross-checks, we trust that the global picture represented by these data

is reliable and rather conservative. Specifically, our result on global biomass extraction per capita is lower than that obtained in several studies of biomass consumption in agricultural and industrial societies (26). In addition, we have assumed a low amount for timber extraction (Table 5 of the *IS*). The results of changes in productivity induced by land use (APPNLC) may be less robust due to the limited availability of consistent data sources but are within the range of other estimates. Our APPNLC value is lower than the estimate by Vitousek *et al.* (2) but higher than that obtained by DeFries *et al.* (10,27). This latter study, however, may have overestimated the belowground fraction of PPN in cropland, which is markedly lower than that in natural vegetation (25). Interestingly, our 5% result for APPNLC above ground surface is almost identical to the amount given by DeFries *et al.* (10) for total APPNLC.

The similarity between these results and those of other authors, however, is partly coincidental, since their definitions of the AHPPN differ substantially. In order to assess the significance of the definitional issues (Table 4), we have recalculated the AHPPN according to the definitions used by Vitousek *et al.* (2) based on our database. spatially explicit (column 2) and we have compared the results with their original data (column 1). The three approaches presented by Vitousek *et al.* start from the definition we have used in our evaluation. In their “low estimate”, they included only the biomass consumed by humans or livestock. Their “intermediate estimate” encompasses the full NPP of “human-dominated” ecosystems, and the “high estimate” also considers productivity losses compared to potential vegetation (ie APPNLC). Surprisingly, the overall differences in results between our calculations and the original data from Vitousek *et al.* are relatively small, except for the “low estimate”, which is considerably less than our calculations. Here, Vitousek *et al.* used extrapolations made for total food and food uses from per capita values of human and animal intake, whereas our estimate is based on agricultural statistics. Part of the difference can also be explained by the fact that the calculation by Vitousek *et al.* referred to data from the late 1970s and early 1980s, while our base Data refers to the year 2000.

Our calculations give lower results for the amounts of biomass appropriate to Vitousek’s “intermediate” and “high” definitions, but our results for PPN0 and PPNact are also lower, so the results for AHPPN expressed as a percentage of the PPN0 are almost identical. Therefore, we have concluded that the differences between our results and those of Vitousek *et al.* are largely due to differences in definitions. Similar observations can be made for other studies. For example, Imhoff *et al.* (16) used yet another definition as they did not consider appropriation or changes in productivity induced by land use or NPP in areas controlled by humans. Therefore, the similarity between our results and those of Imhoff *et al.* is somewhat coincidental. Consequently, we suspect that success in harmonizing AHPPN definitions would largely remove the impression that AHPPN estimates are extremely uncertain (17): differences in results due to different definitions appear to be very large, greater than those resulting from the different calculation methods or the different data.

Table 3. Regional breakdown of the global AHPPN (excluding human-induced fires) during the year 2000. [For the definition of the regions, see Table 6 of the *IS*].

Region | Area, Million km⁸ | PPNo, gC/m2/yr | PPNact, gC/m2/yr | PPNh,* gC/m2/a | PPNt, gC/m2/yr | AHPPN,* % | APPNlc, % |

north of

Africa and West Asia | 10.3 | 83 | 70 | 22 | 48 | 42 | 16 |

Sub-Saharan Africa	24.0	562	497	39	458	18	12

Central Asia and Fed-eration	20.5	405	372	14	358	12	8

Russian							

East Asia | 11.5 | 363 | 344 | 107 | 237 | 35 | 5 |

South Asia	6.7	382	325	183	142	63	15

Southeast Asia	4.5	1,022	850	133	717	30	17

North America	18.5	432	399	62	337	22	8

Latin America and the Caribbean	20.3	811	751	66	685	16	7

⁸ Original title: *The Vanishing face of Gaia*.

Western Europe	3.7	551	512	183	329	40	7

Eastern and Southern Europe	2.2	597	436	150	286	52	27

Oceania and

Australia | 8.4 | 455 | 430 | 25 | 404 | 11 | 6 |

Total	130.4	502	454	63	391	22	10	*Excluding human-induced fires.

There is a wide range of variation in the geographic distribution of human use of the biosphere (Fig. 1). The spatial distribution of AHPPN expressed as the percentage of PPN0 appropriated in each grid cell (Fig. 1b) is a useful indicator of the intensity of land use that can be quantified and Locate changes in ecosystem processes due to human activities. The map we present here differs from the one presented by Imhoff *et al.* (16). Their map represents the amount of AHPPN caused by human consumption in each grid cell, thus assigning AHPPN to where biomass is consumed, not where appropriation occurs. Our map, on the other hand, locates the appropriation of the PPN and therefore the intensity of human domination of the ecosystems. Since species richness has been shown to depend on AHPPN (5-8), the map presented in Fig. 1 b contains crucial information for the analysis of biodiversity loss.

Table 4. Comparison of the AHPPN according to Vitousek *et al.* with the new calculations of the AHPPN based on our database taking into account the definitions offered by Vitousek *et al.*

Carbon flows

related to PPN | Definition/ “estimate” | Original data from Vitousek *et al.* (2), Pg C/a | Our new calculations, Pg C/a | Deviation, % |

PPN0	—	74.80	65.51	+14

PPNact	—	66.05	59.22	+12

Food	Low	0.40	0.92	-57

Fodder	Low	1.10	3.25	-66

Wood	Low	1.10	0.97	+14

Total	Low	2.60	5.14	-49

Total as a percentage of PPN0	Low	3	8	

PPN of farm-land	Intermediate	7, 50	6.05	+24

PPN of grasses controlled by humans	Intermediate	4.90	6.65	-26

Consumed on natural grazing land natural grazing land	Intermediate	0.40	1.17	-66

Human-Induced Fires	Intermediate	3.55	1.14	+212

Wood extrac- tion	Intermediate	1.10	0.97	+14

Losses in the extraction of wood	Intermediate	0.65	0.33	+97

Land clearing	Intermediate	1.20	Not considered	indefinite

NPP of forest plantations	Intermediate	0.80	1.35	-41

PPN of urban areas	Intermediate	0.20	0.30	-33

Total	Intermediate	20.30	17.96	+13

Total as a percent- age of the PPNo	Intermediate	27	27	

Previous land total	High	20.30	17.96	+13

Land Use In- duced Produc- tivity Change (APPNLC)	High	8.75	6.29	+39

Total	High	29.05	24.25	+20

Total as a percent- age of the PPNo	High	39	37	

Productivity losses compared to potential vegetation (positive APPN_{lc} values; see Fig. 1 *a*) indicate that humans are not able to fully use the productive potential of an area. The ratio between the extraction and the total AHPPN can therefore be an indicator of the efficiency of a region: if the APPN_{LC} were zero, there would be no loss in productivity and the AHPPN would come only from extraction. The breakdown by region presented in Table 3 (for the definition of the regions, see Table 6 of the *IS*) supports the notion that the marked regional patterns of the AHPPN are the result of both the variations in natural productivity and prevailing land use systems. For example, in Western Europe, a high total AHPPN of 40% coincides with only a small APPN_{LC} due to their intensive and highly productive farming systems. In contrast, in eastern and southeastern Europe, with similar ecological conditions, land use has caused a large APPN_{LC} and removals are low. In Central Asia and the Russian Federation, most AHPPN is actually due to reduced productivity; the situation is similar in sub-Saharan Africa. The situation in East Asia (consisting of China, Japan, and Korea), by contrast, is characterized by negligible APPN_{LC} but large total AHPPN. These results suggest that, on a global scale, there may be considerable potential to increase agricultural production without necessarily increasing AHPPN, as industrialized countries have actually been able to achieve this by intensifying agriculture over the last 100 to 200 years. (22).

Our results emphasize land use as a pervasive factor of global importance. Land use not only transforms the emerged surface of the earth (28,29) but also produces changes in biogeochemical cycles (1) and a deterioration in the capacity of ecosystems to provide critical services for human well-being (14). Since the size of the human population (30) and the per capita consumption of food (31), fiber, shelter, and perhaps also energy derived from biomass (32) are set to grow over the next few decades, it is to be expected that the area occupied by cropland and the intensity of land use grow as well (29,33). This does not necessarily have to increase AHPPN as well, because substantial increases in extraction can be achieved through intensification without increasing AHPPN (22). Agricultural intensification, however, often carries environmental costs, such as increased inputs of freshwater and fossil fuels, soil degradation, nitrogen leaching, and pesticide use (29,33,34). Some scenarios, however, predict that the area of arable land will continue to grow in the coming decades to meet the needs and wants of a growing world population (33), which would imply an increase in AHPPN.

In light of these results, measures to promote the use of biomass for energy production as an option to reduce carbon emissions associated with fossil fuels (32,35) should be carefully evaluated. According to our results, humans currently extract more than 8 Pg C/a. This amount of biomass represents approximately a gross calorific value of ~300 exajoules per year (EJ/a), of which around 35-55 EJ/a is used for energy supply services (35). Prominent studies suggest that the use of biomass to generate energy could grow to 200 or 300 EJ/a in the coming decades (32,35). The additional removal of between 4 and 7 Pg C/a required to achieve this level of bioenergy use would almost double current biomass removal and place significant additional pressure

on ecosystems. Examples like this demonstrate the complexity of crafting sustainable development strategies and the need for sustainability science (36) to be based on sound empirical analyzes of the earth's socio-ecological metabolism.

Methods

We have calculated the AHPPN as the difference between the PPN0 and the PPNt, where the PPNt has been calculated by subtracting the PPNh from the PPNact (5, 6); that is, our calculation of the AHPPN requires measuring the value of three parameters: the PPN0, the PPNact and the PPNh. To obtain the PPN0, we have used as data source the MDVG of LPJ (19), with an improved representation of hydrology (18), and we have relied on the concentration of CO₂, in data grids about the monthly climate history and in a soil classification with a spatial resolution of 0.5° (19). After applying it to a 900-year period for calibration, repeatedly using environmental data from the first 30 years of the 20th century, the LPJ model was applied to the period 1901-2002. To calculate the AHPPN, the mean result of the five years from 1998 to 2002 was taken and re-sampled with a resolution of 5 arcmin. Compartments above the ground surface were separated from those below it by factors dependent on plant functional types and biomes (25). The PPN0 map has been represented in Fig. 2 of the *IS*.

To quantify PPNact and PPNh, we have combined statistical data (37) on livestock, agricultural production, and logging from different countries with spatially explicit data on land use from grid-based geographic information systems. A global land use dataset was obtained with a resolution of 5 arcmin (~10km x 10km) that distinguishes five land use classes (infrastructure/urban, cropland, pasture land, logging and wildlands) from recalculating and intersecting Global Land Cover (GLC)⁹ 2000 data ([<http://www.gvm.jrc.it/glc2000>),v][www.gvm.jrc.it/glc2000],[cclxvi] a map of agricultural lands (38), Forest Resources Study/Temperate and Boreal Forest Resources Study (ERF/ERBTB)¹⁰ data on forest area (39,40) and a map of wildlands (28). For the 161 countries considered here (97.4% of global land area excluding Greenland and Antarctica), cropland area matched the FAO-estimated cropland area and forest area matched the data from of the ERF/ERBTB, which is a precondition to obtain reliable estimates of the AHPPN in the different countries based on statistical data on biomass extraction. The area occupied by rural settlements has been calculated based on model assumptions about per capita area demand, population density and development status and has been calibrated against land use statistics, while the surface occupied by urban settlements has been taken from the CTG2000 map. A pre-existing map of the area occupied by wildlands (28) and a threshold for NPP of 20 g C/m¹¹ (41) obtained

⁹ “Global Land Cover (GLC)” in the original. *N. from t.*

¹⁰ “Forest Resources Assessment/Temperate and Boreal Forest Resources Assessment (FRA/TBFRA)” in original. *N. from t.*

¹¹ Original title: *The Vanishing face of Gaia*.

from the application of the LPJ MDVG have been used to identify areas without land use. the earth. Pasture lands have then been calculated as the difference between the total area of each grid and the sum of the four previous classes, assuming that this type of land use occurs in almost all ecosystems (42-44). This data set has been complemented with a map of four types of rangeland quality that has been obtained from the information on land cover and the application of the LPJ model. Highly productive ecosystems well suited for grazing (for example, artificial grasslands on fertile soils) have been included in class 1, and barely suitable unproductive ecosystems, such as deserts, semi-deserts, and scrublands, have been included in class 4. .

The PPN of the real vegetation has been calculated by combining statistical data with applications of the LPJ model. On arable land, NPPact has been defined as the sum of NPP withdrawn, as reported in the statistics, and other fractions not taken into account in agricultural statistics, i.e. agricultural residues above ground surface (eg straw, stubble), NPP losses during the growing season, losses caused by herbivores, NPP from weeds and NPP below ground. Appropriate factors have been used to extrapolate the flows that do not appear in the agricultural statistics from the extraction data (see Text and Table 7 of the *IS*). The spatial allocation of the PPNact in the cropland of the cells of the 5' grid of cropland has been based on a national productivity index calculated with the LPJ model, taking into account the irrigation

[<http://www.fao.org/ag/agl/aglw/aquastat/irrigationmap/index.stm>][(www.fao.org/ag/agl/aglw/aquastat/irrigationmap/index.stm,] 08/ 2005) (see Text of the *SI*). The PPNact of grassland has been calculated based on applications of the LPJ model that have been modified to take into account the effects of ecosystem and soil degradation, irrigation and fertilizer use. To estimate the reduction in productivity caused by the conversion of forests into artificial grasslands, an adequate factor has been obtained from data from measurements made in some places. Soil degradation has been taken into account based on the Human-Induced Global Land Degradation Survey (EGDS)¹²] (45). The supply of biomass available for grazing has been contrasted with the demand for grazing by livestock (see Text of the *SI*). The PPNact in infrastructure areas has been modeled with the LPJ model based on assumptions about vegetation cover, productivity and irrigation (see Text of the *IS*). It has been assumed that NPPact in forests is equal to NPP0 since we lack reliable data to take into account the effects of forest management on forest productivity. Likewise, it has been assumed that the PPNact in unused areas is equal to the PPN0.

We have defined the NPPh as all the biomass extracted or destroyed during extraction over 1 year. We have based the NPPh calculations on statistical data about timber extraction and crop harvesting (37,40) and calculated them as 3- to 5-year means centered on the year 2000 in order to reduce the impact of stochastic events such as unusually good or bad harvests. Biomass extraction on agricultural land and permanent crops has been obtained from the FAO agricultural production database

¹² "Global Assessment of Human-Induced Soil Degradation (GLASOD)" in original. *N. from t.*

using factors to extrapolate types of biomass that do not appear in the statistics discussed in the Text of the *IS* (see also Table 7 of the *IS*). Harvesting of forest products has been calculated using the ERBTB2000 database (40) for 52 temperate and boreal countries and FAO statistics (37) for all other countries. The factors used to extrapolate the types of biomass that do not appear in the statistics (eg bark, roots or leaves) have been obtained from the ERBTB2000 database and from ref. 46 (see Text and Table 8 of the *IS*). The amount of biomass consumed by ruminants in pasture lands has been calculated from the food balances of the different countries, which estimate the demand for livestock feed as the difference between the supply of crops for commercial feed and forage (that appears in the FAO statistics) and the total demand for livestock. Feed demand has been calculated separately for 11 livestock species and country data on feed stocks and production are from the FAO (see Text and Table 9 of the *IS*). Acid biomass has been calculated as the difference between the feed demand and the commercial supply of feed from farmland and agricultural residues. We have assigned the grazed biomass to the grazing land layer based on the grazing land quality map described above, assuming that all land is grazed regardless of its quality. It has been assumed that the highest grazing intensity occurs in the best grazing areas and the lowest in the worst (see Text of the *IS*). Unlike what we have done with cropland and logging, we have not assumed that any belowground NPP occurs on grassland since most plant roots do not die during mowing or grazing (4).

Human-induced fires have not been included in the spatially explicit calculation but are part of the total estimate of the global AHPPN that is summarized in Table 1. We have calculated them based on the data provided by the FAO and the Surface Project. Global Quemada 2000.¹³ The flow back to nature at each location, i.e. crop residues, roots or other losses from harvesting on farmland and logging, and faeces that cattle deposit while grazing have been calculated assuming the appropriate factors (see Text of the *IS*).

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¹³ "Global Burned Area 2000 Project" in original. *N. of the t.*

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3. Texts about reality of primitive life .

Among those who question techno-industrial society and have a love for the wild, there are too many individuals who allow themselves to be carried away by the idealization of primitive peoples and their ways of life, projecting their own values and ideas (often humanist, leftist and progressive) onto them.) when creating an image of humanity (or even Nature) precivilized. As if that were not enough, often the sources used, both to defend the idealization of the primitives and to refute it, are equally biased by the ideology and values of their respective authors. In this section we include some texts that provide important data about this complicated topic.

As usual, we add critical introductions to many of them to point out some of the important points on which we disagree with the authors, as well as certain ideological biases that should not be overlooked.

- The debate on good ecological health . By Raymond Hames.
- Some truths about becoming primitive . By Brend Ladd.
- Conservation and subsistence in small-scale societies . By Eric Alden Smith and Marc Wishnie.
- Enter into conflict . By Steven A. LeBlanc and Katherine E. Register.
- Romantic primitivists. By Harold B. Barclay.
- An ecological way to see the Indians. By George Wuerthner.
- Primitive communism: Marx's idea that before agriculture and animal husbandry societies were egalitarian and communal by nature is very influential and quite wrong. By Manvir Singh

Presentation of "THE DEBATE ON THE GOOD ECOLOGICAL WILD"

The scientific article that we present below deals with the impact that some primitive human societies could have had on wild ecosystems, reviewing the current state (2007) of anthropological knowledge on the conservation (or destruction) of wild ecosystems by humans. primitive societies, both hunter-gatherers and horticultural. All this from an empirical and materialistic approach.

Its author, Raymond Hames, has a doctorate in anthropology from the University of California-Santa Barbara and teaches at the University of Nebraska-Lincoln. His field work has been developed, mainly, among the Ye'kwana and Yanomamo Indians of Venezuela during different periods between 1975 and 1989, and his research work has focused on behavioral ecology, the exchange of food and work, the human ecology, marriage, parental and family investment, and the Amazon.

Starting from the critique of techno-industrial society and civilization, it is necessary and inevitable to take certain aspects of hunter-gatherer groups as references (for example, that they are the type of human organization most compatible with our natural characteristics and tendencies and, therefore, , less compatible with current society), however, too often, many people fall into the idealization of such groups, focusing attention on those characteristics that most attract them and denying or falsifying the reality about those that generate rejection. In this second group is usually, among others, their not always harmonious relationship with nature. The intention of publishing this text is to provide information and references that help us acquire a more rational and true vision of the relationship of primitive societies with the environment in which they live, to move away from, and criticize, those who idealize them and move forward. in the construction of a solid and serious ideology contrary to the techno-industrial society.

THE DEBATE ABOUT THE NORMAL ECOLOGICAL SAVAGE¹

By Raymond Hames

Introduction

In April 2005, I read Krech's assessment of the reactions to his monograph *The Ecological Indian* (1999). In this book, the author concluded that little, if any, evidence of conservation could be found among pre-European contact American Indians and much that demonstrated a lack of conservation during contact times. It also provided evidence that while some indigenous peoples are interested in conservation, others are not. This view is consistent with the most important articles published so far on conservation in the ethnographic field (for example, Smith and Wishnie 2000). Ironically, in the same issue of *American Anthropologist*, I came across a book review (Stoffle 2005) on Native American cultural resource management in which I found the following:

For tens of thousands of years, the people of the New World sustainably used and managed these ancient human ecosystems (...) Conservation ethics based on traditional ecological knowledge were coupled with the fact that the ecosystem was culturally central to people. (p.139)

Of course, it depends on what the commenter means by "sustainably used or managed", however it seems that it will take some time for specialists, not for lack of desire or effort, to obtain proof of the rarity of conservation in any society to gradually influence scholars from other areas. In the *Annual Review of Anthropology* alone, over the last ten years, four chapters have been devoted to the question of conservation. From the point of view of cultural anthropology, Orlove and Brush (1996) analyzed indigenous knowledge and participation in conservation efforts. Another review, from cultural anthropology, carried out by Smith and Wishnie (1999) is the one that comes closest to the approach taken here. After theoretically distinguishing sustainability from conservation, these authors reviewed the arguments for and against conservation and identified the factors that promote or inhibit it. The other two articles came from archaeology. Stahl (1996) addressed the archeology of biodiversity during the Holocene, covering natural changes (El Niño² and volcanism) and man-made changes in relation

¹ Translation by BR of "The Ecologically Noble Savage Debate", originally published in *Annual Review of Anthropology*, n°36, pages 177-190 (2007). *Translator's note.*

² El Niño is a global climatic phenomenon, with a cycle that varies between three and seven years, which consists of a change in the movement patterns of marine currents in the intertropical zone, causing, consequently, a superimposition of the warm waters coming from the north of the equator on the very cold emersion waters that characterize the Humboldt or Peru current; This situation causes extreme weather events such as floods or droughts in different parts of the world. *N. of the trad.*

to hunting, fires, deforestation and associated changes agriculture such as irrigation, terracing, or raised fields (see also Redman 1999). Hayashida (2005) analyzed the long-term effects on landscapes and biological diversity by human populations through archaeological evidence (see also collection edited by Lyman and Cannon 2004). Lastly, the debate regarding the role of humans in the context of the extinction of megafauna worldwide is an area of intensive archaeological and paleontological research. Unfortunately, space limitations preclude reviewing that area here. As a sample of this extensive bibliography interested readers should see: True *et al.* (2005) and Miller *et al.* (2005) for Australia, Surovell *et al.* (2005) on proboscideans worldwide, Steadman *et al.* (2005) on New World sloths, Stewart *et al.* (2004) on European Neanderthals, and Kelly and Prasciunas' (2007) excellent review and critique of Martin's overkill hypothesis³.

On a more popular level, Diamond's best-selling *Collapse*⁴ (2003), a monographic compendium of human-caused historic and prehistoric ecological disasters, convincingly raised the question of environmental degradation. organic to the general public. Borgerhoff Mulder and Coppolillo (2005) have written a wonderful new manual on conservation from an anthropological perspective. In a way, ecological nobility is patently related to a reexamination of the so-called case of the noble savage, in terms of social egalitarianism (Boehm 1999), cultural psychology (Edgerton 1992), racism (Ellingson 2001), and the capacity for peace (Keeley 1995, LeBlanc 2003).

History and origins of the good ecological savage

According to Ellingson (2001), in his aptly titled book *The Myth of the Noble Savage*, the term "noble savage" was first used in English by Dryden[318] in 1672, but had its origin in the 1609 New World writings of the French explorer Lescarbot. For various reasons, all of them examined by Ellingson, it was incorrectly associated with Rousseau and served as a critique of European society at the time. It was used as a stereotype to highlight the problems faced by Europeans and to show a way of life in which those problems were absent (Buege 1996). More important to the current debate, Nadasdy (2005, p. 298) suggests that its most recent base began with the late 19th century conservationists George Bird Grinnell, Ernest Seton, and more recently Gifford Pinchot. Grinnell had spent some time among the Pawnee⁵ and Ponca⁶, and Pinchot was familiar with Speck's[321] ethnographic work on the hunting grounds of

³ The "excessive killing hypothesis", put forward by geologist Paul S. Martin (1928-2010) in the 1970s, asserts that humans were responsible for the extinction of the Pleistocene megafauna in America, Eurasia and Oceania. *N. of the trad.*

⁴ There is a Spanish translation: *Collapse. Why some societies endure and others disappear*, Debate, Barcelona, 2006. *N. of trad.*

⁵ North American Indian tribe that, before the arrival of Europeans, occupied the middle basin of the Platte River, in the current states of Nebraska and Kansas. *N. of the trad.*

⁶ North American Indian tribe that, before the arrival of Europeans, occupied the area around the mouth of the river

the Algonquian family[322]⁷. Both claimed that American Indians were originally conservationists. It is very likely, though far from proven, that these claims filtered through the conservation organizations that praised these men, whose philosophies became part of the tenets of many of those organizations.

Whatever its exact origins, the idea that indigenous peoples lived in harmony with the environment was indirectly reinforced from the field of cultural ecology through the energy flow theory of Odum (1972) and others, who argued that ecosystems were rigorously organized systems that tended towards balance or stability. Perhaps a zenith was reached in biology when Wynne-Edwards (1962) claimed that social species had developed a series of adaptations that prevented the degradation of their habitat. These theoretical currents of Odum and Wynne-Edwards, together with the prudent predator hypothesis of Slobodkin⁸ (1974), were picked up by anthropologists and developed in the influential works of Rappaport (1983) and Meggers (1971) and, to some extent, by cultural materialists such as Harris (1968, 1974). The idea that cultures or populations were the units of selection was a key idea that united these theorists. Groups that created stable mechanisms of population control were able to outcompete those that did not. Especially influential were his ideas about war as a cultural solution to the problem of resource balance. Consequently, early claims that indigenous peoples lived in harmony with the environment found theoretical support in cultural ecology.

The idea of indigenous harmony also had, superficially, a certain empirical sense. Most of the environmental degradation was caused by state societies, while tribal peoples embedded in tropical rainforests or deserts appeared to have little negative impact on the environment (Borgerhoff Mulder and Coppolillo 2005). The proof of this association is seen in several comparative studies that show an association between biodiversity and the distribution of indigenous peoples: high biodiversity associated with the presence of indigenous peoples and low biodiversity in relation to the non-indigenous population (Borgerhoff Mulder and Coppolillo 2005, pp. 81-88; see also Redford and Robinson 1987 on indigenous and non-indigenous hunting). But doubt grew among the anthropological community as empirical researchers sought to evaluate such claims. Early skeptics, such as Rambo in his ethnography evocatively titled *Primitive Polluters* (1985) and the cultural geographer Diamond (1986), presented well-documented counterexamples of both indifference and ecological destruction by of tribal peoples. Others, such as Smith (1983), Hames (1988, 1991), and Alvard (1994,

⁷ The term “Algonquin” designates both an Amerindian linguistic group and the group of tribes that spoke languages of that group. Before contact with Europeans, Algonquian tribes occupied much of the American Northeast, including territories in present-day New England, Minnesota, Wisconsin, Michigan, Illinois, Indiana, Iowa, Montana, Kentucky, and much of Canada east of the Mountains. rocky. *N. of the trad.*

⁸ The American ecologist Lawrence B. Slobodkin (1928-2009), one of the forerunners of modern ecology, put forward in the 1960s the “prudent predator” hypothesis, according to which populations Most predators choose their prey by capturing those individuals with the slowest growth rate and the lowest potential for reproduction, thus maximizing the production of potential prey. *N. of the trad.*

1998), influenced by behavioral ecology, had serious doubts about group-level adaptations and provided theoretical criticism and empirical research to demonstrate that conservation either occurred mainly under limited circumstances or went undetected, despite research designed to detect its existence. An extensive review of those efforts is presented by Smith and Wishnie (2000).

Revisionism perhaps reached a high point in 1991 with the publication of Redford's (1991) article "The Ecologically Noble Savage," in which he argued that the idea of deliberate conservation by indigenous peoples was a myth (see also Stearman 1994). The development of sound evolutionary and microeconomic approaches emphasizing the individual level of selection and of detailed ethnographic (eg Alvard 1993) and historical (eg Krech 1981) studies of extractive foraging⁹ or other behaviors, showed that the conservation of natural resources by indigenous peoples either did not occur or was a consequence of low population density, simple technology and the lack of external markets that stimulated overexploitation (Hunn 1982).

The meaning of conservation

Most of the debate about the ecological noble savage revolves around how "conservation" is defined, as well as the related concepts of "management" and "sustainability". Ruttan and Borgerhoff Mulder (1999, p. 621) point out that conservation has been defined in different ways depending on the discipline that studies the phenomenon. For the US government, "conservation commonly refers to the maintenance of genetic, species and ecosystem diversity at the natural abundance in which they are found (OTA 1987)"; for evolutionary ecologists, "...conservation actions are costly by definition and imply the sacrifice of immediate benefits in exchange for deferred ones"; and for conservation biologists "...researchers with a greater interest in applied biology tend to consider that the intent to conserve, evidenced by institutional design, is sufficient."

As Smith and Wishnie (2000) have observed, "conservation" refers to actions that prevent or mitigate biodiversity loss and are designed to do so. The design criterion is key, being Hunn (1982) the first to draw attention to it in the field of anthropology. He distinguished epiphenomenological (or collateral) conservation from true conservation. Epiphenomenological conservation is a consequence of the inability of a given human population to cause resource degradation or a mere observation about long-term resource balance. It can also be a consequence of low population density or limited technology or consumer demand. Today, the term "sustainable use" or "sustainability" is almost identical to epiphenomenological conservation, and it is clear that many tribal peoples extract their resources sustainably. For example, Redford and Robinson (1987) compared the hunting practices of indigenous and settlers in the Amazon. Analyzing the hunting yield of 16 indigenous groups and 6 Peruvian and Brazilian settlers who

⁹ "Foragers" in the original. Although in Spanish "forageador" (literal translation of "forager") refers to someone who harvests or collects forage, and is used in a context related to livestock or agriculture, in anthropology the term "foragers" is used to refer to human cultures whose food production is fundamentally based on hunting, fishing and gathering; and it is with this meaning that it is used in the text. *N. of the trad.*

inhabited the forest, they showed that the settlers had hunted a more restricted range of species and tended to have a greater impact on the populations of those species, due to a higher population density, habitat degradation, satisfaction of external demand and more efficient technology. Amazonian Indians, by comparison, hunted a wider variety, and although they based much of their diet on hunting, they did not harm the populations of the species they hunted as significantly as the settlers.

On the other hand, there seems to be no agreement on the definition of the term “management”. On certain occasions, management exists when individuals take deliberate steps to modify the environment in a way that increases the availability of useful resources for humans (Balée and Erickson 2006). Common examples include the practice of burning grasslands to inhibit tree encroachment and increase forage density that attracts herbivores that humans hunt, as well as a wide variety of very specific practices such as honey collectors leaving part of of this in the comb so that the bees can recolonize the hive (Posey 1998). In fact, some environmental historians argue that although indigenous peoples may be ecologically damaging agents, their overall effect is to improve the environment (Balée and Erickson 2006, p. 10). This argument is deeply problematic since it is based on the premise that improvement is defined by the increase in biodiversity. Questions such as how, why and for whom the increase in biodiversity is beneficial are not examined; the increase in biodiversity is simply assumed to be an absolute good.

If conservation and sustainability lead to the same end, then why bother to distinguish between the two? If resources are historically used sustainably, but a change occurs, such as an increase in foreign demand (fur, leather, and feather trade), a reduction in territory, or the introduction of superior technology (shotguns), then the resources are likely will no longer be used sustainably. However, if a group practices true conservation, then there is more opportunity for that group to be able to adapt to changes in demand, harvest efficiency, or habitat loss.

The critical question in this debate is an analysis of what people actually do to change the environment, regardless of their beliefs about it. Many of the critics of the so-called new non-conservation orthodoxy (Headland 1997, Hunn *et al.* 2003, Nadasdy 2005), skew the debate towards considerations of traditional ecological knowledge and beliefs about the environment. A particularly striking example of this is Nadasdy’s postmodern claim that conservation is a Western concept alien to Native American belief systems. Other than offering scant evidence that this is true for any one group (see Hunn *et al.* pp. S79-80, for the Tlingit Huna¹⁰ regarding parallels between the concepts Western and indigenous conservation groups) or generalizable to other indigenous groups, the argument is irrelevant. The human impact on resources is the only statement evaluated by the so-called new orthodoxy. Nadasdy (2005) also ensures that the

¹⁰ The Tlingit are a group of North American Indian tribes whose historical territory, before the arrival of Europeans, extended along the Pacific coast from the Portland Canal to the Copper River Delta, including almost all of the Alexander Archipelago; the Huna (also Xunaa) being one of the *kwaans* or tribes into which the Tlingit were divided. *N. of the trad.*

definition of conservation has a biased, judgmental and Western elaboration. While this statement is partly true, it is judgmental only in a neutral descriptive sense: a people either take part in conservation or they don't. The answer does not necessarily lead to a moral conclusion. Although conservation may be a Western concept, its origins do not make it incorrect or inapplicable. The evidence needed to decide the debate revolves around human impact on the environment and not human beliefs about the environment and our place in it. This is not to say that beliefs are not worthy of investigation (Hames 1991, Smith and Wishnie 2000, p. 501) and even necessary for true conservation. The point is that beliefs and worldviews are not enough.

Reactions to Krech's *The Ecological Indian* and Diamond's *Collapse*

Most of the debate regarding the ecological noble savage has taken place among scientific researchers engaged in anthropology, conservation biology, and political science. With the publication of Krech's *The Ecological Indian*, this debate has been joined by humanities-oriented historians and anthropologists as well as political activists (Krech 2005). A conference entitled "Re-Figuring the Ecological Indian" was held at the University of Wyoming in 2002 and has been published in an edited volume by Harkin and Lewis (2007). The Krech Monograph is a set of historical monographic studies on the impact of American Indians on deer, beaver, bison, and other important game species, as well as a review of the paleontological evidence for excessive killing of megafauna and an archaeological analysis of the Hohokam¹¹. The goal of Krech's work was to investigate two questions: (a) Were American Indians ecologists? and (b) were they conservationists? To the surprise of many, the answer to the first question is generally yes: Native Americans understood the complex interactions of the environment. But the answer to the second question is mostly negative: American Indians did not make systematic efforts to conserve game species and historically decimated many species on which they depended. The exception appears to be beaver conservation by Algonquian foragers using a territorial trapping system. However, in the introduction to the aforementioned volume, the editors, Harkin and Lewis, argue that behind the ecological Indian there are issues not addressed by Krech. For example, they are interested in how American Indians use the image of ecological nobility to rally political and ideological support for their legal struggles, how nobility relates to identity, and how American Indians they conceptualized human predatory actions and prey responses. Others in the volume (eg, Dorst 2007) are concerned with how European-descended Americans portray the Indian image in museum exhibits and other media. These are strange contributions, as Krech carefully restricts his research to ecological knowledge and human impact on resources. Many of the authors may accept Krech's basic conclusions and have drifted to other issues. Be that as it may, these secondary issues figure prominently in some chapters of this volume.

¹¹ The name "hohokam" is used to refer to an Amerindian agricultural culture that developed between the 2nd and 15th centuries AD in southern North America, in the lower reaches of the Gila and Salado rivers, in the south of the Sonoran desert, in present-day Arizona, Sonora, and Chihuahua. *N. of the trad.*

In his opening chapter for the book, Krech provides an overview of the initial critical reaction to his work (Krech 2007a) and, in that same volume, he responds to his critics in “Afterword” (Krech 2007b). Given the focus of Krech’s research, criticism might be expected to include questions about whether his claims are true or false, whether his response is biased or an oversimplification of a complex process, whether he established appropriate controls, or whether your analysis is historically contextualized. Many of the contributors (Burch 2007, Feit 2007a, Flores 2007, Kelly and Prasciunas 2007) directly examine Krech’s claims. But the image of American Indians as conservationists extends beyond the narrow limits of academics. This is a core belief about American Indians promoted by certain anthropologists, conservation groups, and the general public (Ridley 1996). This belief is sometimes used by Indian groups to compile arguments about their identity, property rights, sovereignty, and ethical superiority (Krech 1999). This second set of critiques addresses the potential role that Krech’s research (and by extension any research that focuses on the reality of beliefs held by political protagonists) may have on the identity, sovereignty, political action, and cultural pride of American Indians, as well as Krech’s hidden goals and motivations. As he himself (2007a) points out, the only thing he shares with his second set of critics is that European-descended Americans caused greater ecological damage than American Indians did.

Many of the articles in the book support Krech’s general claim that American Indian practices were not directed at conserving resources, especially in the case of hunting. Burch (2007) shows that Alaska Native hunters drove several species to local extinction. He makes an interesting distinction between overkill (killing more than can be used in the short term) and unrestricted take (killing in an unsustainable way). As might be expected, the conclusions he draws from an examination of the historical record are complex. Almost all groups hunted sustainably until the arrival of Europeans. However, with one possible exception, sustainability was not deliberate. The introduction of rifles, the high value of the local leather and fur centered trade, and perhaps religious conversion led to clear cases of unrestricted take. Flores (2007) and Harkin (2007) present data on bison hunting and salmon fishing on the Northwest Coast, which is generally consistent with Krech’s position.

Feit’s (2007a) contribution presents evidence that beavers were conserved by Indians through a system of family hunting territories, thus rejecting Krech’s position that conservation was, in part, a result of contact. It provides behavioral evidence that the Cree¹² left roosting areas and restricted harvesting of beavers of various age and sex classes in order to make harvests sustainable. The system appears to have been maintained through territorial control of hunting areas by extended family groups. As others have noted (eg Hames 1988, Hardin 1968, Smith and Wishnie 2000), zonal control of

¹² The Cree are one of the North American Indian tribal groups of the Algonquian family. They included, among others, the Naskapi and the Montagnais, groups much studied by anthropologists. They had their historical territories in present-day Québec, Ontario, Manitoba, Alberta, and Montana. *N. of the trad.*

resources, whether private or communal, is a necessary prerequisite for conservation. Feit has examined Krech's work in two other publications (Feit 2004, 2007a and b), reflecting in them on some of the political aspects and motivations supposedly behind Krech's work. Again, the most contested question revolves around the historical scope of Algonquian conservation and the role that Europeans may have had in influencing Algonquian conservation.

Krech believes that the preservation and establishment of family hunting territories is, in part, a consequence of contact with Europeans.

On the contrary, Feit thinks that these territories were an invention of the Indians. What is important in this particular discussion is to recognize that both Feit and Krech believe that many Algonquians had and continue to have a conservation system designed to maintain beaver populations.

Ronco's (2007) chapter is by far the most critical and the one that deviates the most from the explicit purpose given by Krech. As Krech perceptively points out, "with the rhetorical strategy of an environmental law student," Ronco lays out why he doesn't like the results. Judicial arguments are not aimed at finding the truth or impartially examining the evidence, but are subordinate to a cause. Ronco argues that ecological legitimacy underlies American Indian identity and political influence, and that anything that undermines these beliefs harms the latter. This is reminiscent of the statement made by Posey (cited in Ridley 1996, p. 217) in relation to the peoples of the Amazon: "...[A]ny evidence of ecologically negative activities carried out by indigenous or traditional peoples undermines their basic rights over land, resources, and cultural practices" (for a nearly identical statement, see Hunn *et al.* 2003, p. S8). Ronco's criticisms are not about whether or not Krech is wrong but about how his conclusions affect political agendas and the identity of American Indians. Ronco offers no evidence that Krech's research had any effect on American Indian sovereignty or why basing one's identity on a false belief is useful (see also Deloria 2000). (But see "Wildlife Reserves and the Ecological Noble Savage" below). The question shifts from the truth or falsity of the empirical claim to its potential consequences, positive or negative. If the impact is potentially negative, then the conclusions are questioned or denied.

The Ronco and Fiet chapters partially point out what I consider to be the greatest weakness of Krech's analysis (see also Hunn *et al.* 2003, p. S81, and Burch 2007). Except for his analysis of archaeological and paleontological data, Krech studies peoples that have been affected primarily by external forces. With the European invasion of the New World, indigenous peoples were dispossessed of their lands, pushed into marginal areas or into areas already inhabited by other indigenous peoples; Forced to share their resources with the Euro-Americans, they witnessed how traditional resources reached astronomical values due to the action of foreign markets, and they acquired superior foreign hunting technologies (firearms and steel traps). Any of these factors could have transformed a stable system into one headed for disequilibrium. Burch (2007), in the same volume, accurately illustrates how many of these historical processes transformed

Inuit hunting (see also Holt 2005 on the Huaorani¹³ of the Amazon). Although Krech documents these factors, he does not really consider the possibility that they might have destroyed indigenous conservation systems, if they had existed.

Diamond's bestseller, *Collapse* (2003), presents a series of case studies of human-caused ecological catastrophes, and has received far less negative feedback than Krech's work for perhaps three reasons: except for a chapter on the Anasazi¹⁴, Diamond does not focus on North American Indians, conservation success stories are recounted, and many of his examples are from societies more technologically complex than those concerned with the concept of the noble ecological savage. It shows, however, that human-caused ecological destruction occurs at all levels of social complexity. Each chapter is monographic, documenting different human-caused impacts such as erosion, loss of fertility and salinization of soils, and a variety of overexploitation of biotic resources in all economic formations by almost any method of production. extraction. At the same time it shows examples of the mitigation of exploitation by humans such as the casuarina plantation¹⁵ in New Guinea, the post-Tokugawa Japanese reforestation¹⁶, the ban on pork in Tikopia¹⁷, and the control of fishing in Polynesian reefs. Many of the explanations Diamond provides are not new (Easter Island and salinization from prehistoric agriculture in the Middle East), and have been studied by archaeologists (eg Redman 1999). The strength of the book rests on its willingness to consider all reasonable factors, from climatic changes and biogeography to cultural preferences in subsistence and eating patterns, and how all of these can interact to form a very complex scenario. What is missing from Diamond's and others' interpretations is a coherent explanation of why some groups (for example, Tikopia) were able to prevent degradation while others (for example, the Vikings in Greenland) were not, or they couldn't do it. The subtitle "how some societies choose whether to succeed or fail" is a bit disingenuous and contradicted by the research itself: the invisible salinization of soils suggests that the choice is impossible when causes or alternatives are unknown. In reality, on this question, more inventories of successes or failures are not needed, but rather models

¹³ The Huaorani (also called Aucas or Waos) are Amerindians who live in the Amazonian region of Ecuador (in the provinces of Napo and Pastaza). Its historical territory extended between the Curaray and Napo rivers. They were nomadic hunter-gatherers who practiced small-scale horticulture; and although some groups have rejected contact with the outside world and continue to live as nomads depending primarily on wild resources, the vast majority have become sedentary and depend heavily on agricultural resources. *N. of the trad.*

¹⁴ The Anasazi were a North American Indian people who occupied, divided into various groups, the territory of the current states of Colorado, Utah, Arizona, and New Mexico. *N. of the trad.*

¹⁵ Casuarinas are a group made up of several dozen species of trees and shrubs whose leaves resemble pine needles or horsetails, they are native to the Pacific Islands, Australia, Southeast Asia and the Eastern tropical Africa. Its wood is easy to cut and very hard, in addition, its bark is rich in tannins. Specifically, the author refers to the *Casuarina oligodon*, native to New Guinea. *N. of the trad.*

¹⁶ Tokugawa is the name of the dynasty that reigned in Japan between 1603 and 1867. *N. of the trad.*

¹⁷ Tikopia is a small island in the southeastern Pacific. *N. of the trad.*

that help to understand the conditions under which societies are capable of succeeding or failing in stable ecological adaptation. Diamond provides some guidelines. As he says, in certain cases the causes are unknown. In others, short-term needs (preventing children from starving) preclude long-term conservation. Drastic climate change can undo stable adaptations. The list is long. Diamond suggests that human ingenuity has its limits, and that we cannot make effective cost-benefit decisions after adapting to a difficult ecological situation.

Hunn *et al.* (2003), in a context of explicit criticism of both Krech's *The Ecological Indian* and Diamond's *Collapse*, present a case of deliberate resource conservation planning: the eggs of seagull by the Tlingit Huna. After the demonstration, they conclude that "conservation by indigenous communities should be seen not as the exception, but as the norm" (p. S99). This generalization is alarming, since we only seem to have two possible examples of conservation (this study and Feit's study of the Cree) and a multitude of studies showing no conservation at all (Smith and Wishnie, 2000).

Traditional ecological knowledge

Indigenous peoples have a broad and deep understanding of their local ecosystem. For decades, the fields of ethnoecology and, more specifically, traditional ecological knowledge (TEK) (Gadgil *et al.* 1993) have clearly documented this fact. However, on concrete issues, some groups have incorrect ideas about the causes of resource depletion, the consequences of continued extraction, and the means of increasing resource abundance in their environments (Borgerhoff Mulder and Coppolillo 2005, pp. 82-89). This question is important for those investigating the reality of conservation. Those who maintain that indigenous peoples generally do not conserve resources affirm that conservation is the consequence of deliberate acts (the restriction of the use of resources) designed to produce sustainable collections and/or captures over time. Therefore, to some extent, knowledge of the causes and consequences of harvests over time is required (Holt 2005). To be reliable, such knowledge does not have to be empirically accurate. For example, a belief system that posited that the spirits of hunted animals would cause them to hide at the bottom of a lake if they were hunted too hard, and that they would only reappear if the hunters limited their catches, is a belief system that could lead to conservation. The dynamics between scarcity and abundance are correctly associated with levels of human predation, although the mechanism (spiritual intervention) is incorrect.

Smith (2001) is one of the few specialists who have clearly investigated the cognitive bases of conservation. She points out that if conservation exists, then conservationists need to have some kind of realistic understanding of the presence and causes of resource

depletion. In his investigation of the Machiguenga¹⁸¹⁹ of the Amazon, he asked his informants about whether game had become scarcer over time and about the causes of such scarcity. When asked why over time game had become scarce near the village, most replied that it had been scared away or was hiding. When asked if the total number of animals had remained stable, 81% said that the number of animals had remained stable or even increased but that they were simply further away from the village than they used to be. Similar results were obtained about the availability of fish. When asked about orchard fallow periods, nearly all fell short of the time needed for full recovery of soil nutrients. Furthermore, explanations for poor yields were attributed not to soil problems in repeatedly cultivated areas, but to bad seeds or "spiritual contamination." Smith also reproduced Alvard's results on the selective hunting criterion: females, pregnant or not, are hunted just as avidly as males. As has been described elsewhere, in some cases a group believes that certain resources are inexhaustible (Vickers 1995) or can be guaranteed through rituals (Brightman 1993).

Zavaleta's research on Yup'ikxx waterfowl hunting²⁰ (1999) presents a carefully studied case of indigenous conservation in modern times. It not only examines historical data on predation and an understanding of Yup'ik seabird population dynamics and government regulation, but also presents unique data on Yup'ik conservation motivation. Regarding the motivations, it determines that, while some hunters simply followed the federal regulatory law, many others were clearly motivated to conserve for the future. This is a compelling case of true conservation arising in a traditional community, and his holistic approach to the problem serves as a strong model for others to emulate.

Nature reserves and the noble ecological savage

The ecological noble savage has two political dimensions. The first deals with how this concept is used by indigenous peoples to identify the essential characteristics of their culture and worldview, and how it is used politically in their struggles for self-determination and equality. The second concerns how indigenous peoples are used by conservation organizations to advance their agendas and the ongoing struggle between indigenous peoples and these organizations. Beginning with the second dimension, relations between indigenous peoples and international conservation non-governmental organizations (NGOs) have been marked by initial collaboration and now by growing estrangement (Chapin 2004). Collaboration with conservation groups reached perhaps its highest point around the time of the Earth Summit in Rio de Janeiro in 1992. At that summit many NGOs used indigenous peoples to advance their agendas, holding

¹⁸ The Machiguenga are an Amerindian horticultural people who inhabit the jungles of the southeastern region of Peru, near the border with Brazil and Bolivia. *N. of the trad.*

¹⁹ Although the term Yup'ik refers to one of the two great branches of the Inuit languages, it is also used to refer to the groups that speak languages of that branch. These groups are spread across central Alaska, Saint Lawrence Island (in the Bering Strait), and the easternmost tip of Siberia. *N. of the trad.*

²⁰ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

them up as examples of cultures with a strong conservation ethic. According to Conklin (1997),

Amazonian Indians are portrayed as guardians of the forest, natural conservationists whose cultural traditions and spiritual values predispose them to live in harmony with the land. This type of essentialist image is created when it is insinuated that primitive peoples are homogeneous entities anchored in time. Undoubtedly, some indigenous leaders welcomed this image and helped promote it both because of the struggles they were facing in relation to the appropriation of their lands and because they realized that conservationists could help them in their struggles. However, this image is false, it is maintained through symbolic activities of a few indigenous representatives and it pits the interests of indigenous peoples against those of their national governments, especially as it relates to their sensitivity to outside intervention. (p.713)

During this period, indigenous representatives were paraded before major environmental conferences as true noble savages who knew the secrets of effective conservation. In the end, conservationists and NGOs created an image of indigenous peoples that does not correspond to their past and certainly does not accurately represent indigenous peoples as a whole (Brosius 1999, pp. 280-81). This image is designed to get donations and support, since it corresponds to the pre-existing values of its supporters and donors from the first world. Today the situation has changed considerably. Leaders of major conservation organizations (World Wildlife Fund, Nature Conservancy and Conservation International) often see indigenous peoples as a problem in relation to the establishment of their protected areas around the world (Conklin and Graham 1995). The exchanges of ideas maintained by Schwartzman *et al.* in *Conservation Biology* (2000; see responses from Chicchón 2000, Colchester 2000, Redford and Sanderson 2000, Terborgh 2000) revolve around whether indigenous peoples and natural parks can coexist. Everyone involved in these exchanges seemed to believe that the evidence showed that indigenous people cause less harm to wildlife than non-indigenous people. For example, Rudel *et al.* (2002) show how large areas of forest have been transformed into pasture by both settlers and jíbaros²¹, but the jíbaros cause less ecological damage because they give more importance to horticulture than to livestock. Schwartzman *et al.* they say that indigenous peoples have never caused the local extinction of species, a claim effectively refuted by Redford and Sanderson (2000) and Chicchón (2000). The central question they face is the role that traditional peoples can and should play in the development and security of nature reserves (Robinson and Bennett 2000). From more extreme positions, within the conservation community, some use ethnographic research to argue that because indigenous peoples do not conserve resources, they should be moved from areas to be conserved. Elsewhere, Terborgh (1999) calls for “a carefully designed voluntary relocation program” (p. 56). The problem here is that a

²¹ The Shuar, also known as Jíbaros, are an Amerindian people who inhabit the tropical forests that extend between the Andes and the lowlands of the Amazon, in present-day Ecuador and Peru. *N. of the trad.*

call for voluntary removal often ends in either a coercive program or a failure to move the Indians to a suitable location.

Unsurprisingly, Chapin's provocative critique in *World Watch* (2004) of the three major conservation organizations received more letters to the editor than any other published article (Flavin 2005). Chapin (2004) said that by planning, establishing and maintaining reserves, the main conservation organizations (World Wildlife Fund, Conservation International and Nature Conservancy) were harming the lives of rural and indigenous peoples. In effect, they were creating "conservation refugees." He strongly pointed out that ensuring the rights of local communities is a matter of social justice that should be a fundamental component of conservation efforts and that, in practice, the cooperation of local communities is essential to the success of conservation efforts (p 30). Many of the responses from the main conservation groups were somewhat conciliatory, recalling that they had begun to approve some of the reforms and guarantees suggested by Chapin. This situation deserves monitoring by anthropologists and other social scientists who are experts in evaluating the social and economic impacts of conservation projects.

Conclusion

The ecological good savage debate has entered a new phase. Following a rigorous definition of conservation as espoused by behavioral ecologists and conservation biologists, it can be concluded that conservation by indigenous peoples is rare. Still, if we are to make reasonable recommendations to the conservation bureaucracy, it is important to fully understand the factors that enable or work against conservation. The question will turn to a more detailed consideration of how people manage (Balée and Erickson 2006) or design (Smith and Wishnie 2000) their ecosystems and how that management or design affects ecosystem stability and biodiversity. It may also lead to renewed and refined interest in how indigenous peoples conceptualize their place in nature and the extent to which that conceptualization affects their behavior towards the environment.

Final statement

The author is not aware of any bias that may affect the objectivity of this review.

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²⁶ There is a Spanish translation: *Environment, energy and society*, Blume, Barcelona, 1980. *N. of the trad.*

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Years ago, a small group of people tried to consolidate a movement against the techno-industrial society and in favor of wild Nature. As one of its first activities, this group drafted a text entitled *Declaration of Principles*. It was a text that exposed the ideological foundations on which, according to that group, a movement that seeks to oppose techno-industrial society as a way of defending wild Nature should be based. Despite the fact that this group no longer exists, we believe that this article is a good foundation on which to base oneself to develop an ideology contrary to the techno-industrial society and that it may serve as a guide for those who wish to form a movement of these characteristics in the future. That is why we publish it here.

PRESENTATION OF “SOME TRUTHS ABOUT BECOMING PRIMITIVE”

This article relates the personal experience of someone who has really tried to live primitively in today's age. The author is not a primitivist theoretician who talks about how easy and comfortable primitive life was without ever having tried to experience this way of life in the slightest or get even partially and temporarily close to Nature. This is precisely what makes this article can be considered at least interesting and, in a certain way, respectable by all those who share the author's interest in wild nature and primitive life.

However, to properly judge what is being said in this article, a few other things need to be taken into account. The first is that the author of the text no longer lives in a primitive way today. Readers (especially those who know English) can look at the following Internet addresses to get an idea of the evolution followed by the author since he wrote this article in the late 1990s:

[<http://web.ics.purdue.edu/~laddb/>][<http://web.ics.purdue.edu/~laddb/>]

[<http://www.permacultureglobal.com/users/1779-brent-ladd>][www.permacultureglobal.com/users/1779-brent-ladd]

[<http://www.agreenerindiana.com/profile/BrentLadd>][<http://www.agreenerindiana.com/profile/BrentLadd>]

The second thing to keep in mind is that even though the author recounts his experiences first-hand and in many cases they are not exactly idyllic, this may not prevent him from falling into it anyway. the idealization of some of the aspects of the primitive way of life. Discovering these possible idealizations will be the task of the readers.

The third important thing to keep in mind in order to judge and understand the value of this text in its fair measure is that it refers to the experience of an American, that is, the circumstances of the author and those of the Spanish readers are surely very different. and make many things that are feasible there unfeasible here.

And finally, the fourth and perhaps the most important thing to keep in mind when reading this text is that, although an interest in wild and primitive nature is a common (and probably essential) trait in those non-leftist individuals who are repulsed by techno-industrial society and civilization, the reverse is not necessarily true. Not

all lovers of wild Nature and the primitive hate civilization, not even techno-industrial society. Or to put it another way, no matter how much personal interest they feel in primitive life and in Nature, the priority task (both collectively and individually) of those who wish to put an end to industrial society must not be to try to return to living in a primitive, pre-industrial way, or something similar, but to try to create and strengthen a movement whose goal is to help destroy the techno-industrial society. Often, unfortunately, many confuse and mix both purposes, without being able to differentiate them.

SOME TRUTHS ABOUT BECOMING PRIMITIVE[i]

By Brent Ladd¹

So you're thinking of changing pace? Do you want to leave behind the struggle to promote your careers and head straight into that wild lake of your dreams called Primitive Way of Life (if possible without even having to go through the little house in the country with sheep, chickens and an organic garden first?)? Great! Your company is welcome. You see, I dove into it two years ago, and I'm still afloat, albeit just barely at times.

I am currently living in Northern Michigan, along with a few other individuals who have also heard and answered the call of the wild.

Steve Hulsey, editor of *Wilderness Way*, asked me to write about my journey over the past few years, and how I feel and experience the facts of a primitive way of life.

I want to do everything in my power to encourage those of you who seek to lead this way of life. However, I am also going to tell things exactly as they are.

Everything I've experienced in recent years has led me to develop some sense of what's wrong with the world. I believe that there are many wonderful human beings who are being depressed, devastated and oppressed by the crazy society around them. Their true desire is to live as close to the earth² as possible. Maybe no one else knows they feel that way and they don't tell anyone for fear of rejection and ridicule. So their secret consumes their thoughts and dreams and they continue to follow the guidelines of that crazy society, living only in their heads the way of life they really want. I know what this is and maybe some of you who are reading this know it too. I also hope that readers can learn from the mistakes I have made. I'm not going to write a sweet, sugar-coated story about primitive life, but I will say that the satisfactions, joys, and freedom I've experienced more than make up for any hardships I've encountered. So this is not an idealization of primitive life, just the human side of my experience of it.

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

What is primitive life like? What are the difficulties, the concessions, the advances and the satisfactions that it entails? At the end of the article I will comment on what I consider to be the two most important aspects of the primitive way of life. They are not listed in any survival manuals, but they can determine how successful one is in making it out in the wild.

Sometimes I think I was predestined to lead a primitive way of life. Even when I was very young I was fascinated by everything that had to do with the “Indians”. He spent hours and hours roaming the tall grasslands of our farm, shooting arrows and throwing spears. Perhaps I was influenced by the books I read, such as *Island of the Blue Dolphins*³. In a way, I have closed a cycle in my life, returning to my early youth.

Like many others, I grew up in a farming community in a rural area, Indiana to be exact. As a child I was in charge of taking care of the pigs, the cows and, sometimes, the horses. I liked being around animals and thought I would probably end up a farmer myself. By the time I graduated, the best thing to do was to go to college, since, after all, making a living from the farm was getting harder and harder. Living in the city, at the university, was exasperating. I was used to roaming the prairies and cornfields. I worked part-time to pay for my classes and books, and of course the occasional party... After two years of learning about commercial farming and animal husbandry and being in a fraternity, I was disgusted with myself and with the university environment. I went home and then back to class, determined to finish what I had started.

Since my weekends were no longer filled with partying and flirting with women, I had more time to think about what I was doing with my life. Even then, I already had doubts about whether I was interested in pursuing a career, especially one related to commercial agriculture. At one of these, without giving it much thought, I signed up for an optional course, Forestry 240-Wildlife in America⁴, taught by Fred Montague. I did not know then that this was going to be a decision of capital importance that was going to determine the path that I would take later. Dr. Montague is one of those exceptional professors who goes far beyond what the course syllabus merely prescribes; in fact, it was more like throwing the program out the window. In his classes, we not only discussed about nature, but about all the factors that affect it: pollution, destruction of habitats, uncontrolled capitalism, civilization itself, etc.

By the time my bachelor's degree came around, I had turned my life around 180 degrees. I wanted nothing to do with commercial farming and was torn between starting a small farm or going to California and trying to get into the music business (I was a

³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

guitarist in a small rock'n'roll band at the time). I was depressed, jobless. It's funny how, when you think you've hit rock bottom, things suddenly change. Something lit up. I liked animals and I liked to watch them. He had a lot of experience working with farm animals. I would dedicate myself to studying the behavior of farm animals! Was there such a job? One phone call, and a few days later I was in the office of a famous expert on farm animal behavior, who was in charge of a graduate student who was studying the effects of music on animals. farm animals. The teacher put me on the payroll. I wasted no time. My job was to help your student with the investigations. I soon scheduled a postgraduate study of my own with my own research projects.

My fellow student and I saw things the same way and we got along well. We made a magnificent team. Before I knew it, we were engaged. By then, I was very involved in the environmental environment. I had become a vegetarian, except for a few times when I ate some pork raised on my family's small farm. I began, with more and more determination, to try to change the system from within.

After a while my marriage began to fail and I didn't even see it coming. After getting my Ph.D., I went to a big university in the South to study behavior and consciousness in animals. Things went wrong and my wife and I ended up working for the United States Department of Agriculture, studying animal welfare.

My marriage was a mess, although I still didn't realize it. It was a dark time for me. I took a week off and went on a humanitarian mission to the outskirts of Juárez, a border city in Mexico. If one had to get a degree to be able to lead a primitive life, I think that visiting a "third world" country should be a must. The ideas that we may have about materialism and about what we have left over, will quickly be entrenched.

I felt greatly reinforced in my decision to leave behind the materialistic/civilized way of life. What was not very clear was where to go to leave him behind.

A friend sent me a packet with information about wilderness survival schools. Among them, I saw one that caught my attention. I wrote them a little note telling them that I would be interested in contacting them. They responded by saying, "Nice to meet you, and by the way, we need staff right now." My intuition told me: "Man, this is yours!". My heart said: "Beware, that, although not happily, you are still married and you would do better to stay if you want this marriage to work." I was trapped, so to speak. My wife must have found out because, to my surprise, she excitedly told me that we should jump at the chance!

A month later, my wife and I were in the woods of northern Wisconsin at survival school. I felt that this was going to be the beginning of my journey along the path of a way of life linked to the land⁵. Still, if you want to canoe down wild rivers you have to accept that there will be rapids and waterfalls. Two weeks after I arrived at school, my wife made it clear to me that she did not want to continue with the marriage. That tore me apart. Only those who have ever been divorced can understand the darkness,

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

pain and anxiety that such an experience brings. I had fallen over the waterfall and was drowning. In fact, for a while, I thought it would be better to die than have to endure the suffering and desolation I was feeling.

I was now on my own, but during the few months that I resided in the survival school, I made some good friends and began to learn some of the basic techniques of primitive living. I also learned to handle a canoe and to live in a primitive shelter. It was my first taste of the primitive way of life, and I still wanted more.

I felt restless, I was moving through the woods of northern Wisconsin. I built a camp of my own consisting of a *wikiup*⁶ covered in birch bark, next to a small lake full of fish. Since I had no money and wanted to make my own deerskin clothing, I offered my services in exchange for skins. I worked putting up a plasterboard ceiling on a local butcher shop renovation, hard work, and in return I got a bunch of deer skins. At that time, I still didn't know enough to procure a sufficient food supply by hunting and trapping, so I had to quickly choose between asking the administration for help or looking for work so I could eat. I took a low-paid temporary job on a farm for a month. Again, either divine intervention occurred or I was luckier than a fool. It happened to be a farm with a diversified production and they allowed me to take home several bags of huge apples and also as many pumpkins⁷ as I wanted. This was a boon to my diet.

Not long after, I found the carcass of a run-over deer in good condition, which had supplied me with meat for the winter. I was beginning to believe that praying was worth something after all!

So, I had abandoned a well-paid research position, paid off my debts, and with the few hundred dollars I had left, wandered the woods of Wisconsin, gradually gaining confidence in my ability to survive. He was an opportunist who would do whatever was necessary to survive without having to return to civilization. In effect, he had broken with civilization on a mental and emotional level. I was more confident in myself and was discovering my true heritage. Knowing that 99.95% of my ancestors had led a hunter-gatherer lifestyle buoyed my spirits. My dreams began to change, from being chased by armed men through the streets of a city to scenes of ancient landscapes and people.

The great melting of Lake Superior makes the forests even quieter. I had plenty of time to be alone reflecting on my past, present and unknown future. This quiet time helped me heal from my old emotional wounds. The days and nights spent on the *wikiup* of my camp were incredibly impressive for me. The first night on the *wikiup* was at the end of the hunter's moon (late October). Frost hung in the air; my favorite

⁶ A couple of examples:

⁷ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

station I jumped out of the bed of balsam fir boughs⁸ when an owl perched on a nearby tree and let out a bloodcurdling scream! If you've heard that closely, you'll know what I'm talking about. The following evening, a few coyotes came down to the lake and announced their presence with high-pitched barks and howls. "So this was nature⁹!" I thought. A few weeks later, I heard a wolf howl for the first time. There was a pack of wolves in the area, although few people had heard or seen them.

Yes, I have been lost in the woods on several occasions, and it is something that makes the heart skip a beat and race! I left the trampled trail, and just as I turned my head, I stepped into a hole and fell. I was a little disoriented when I got back on my feet and the sky had clouded over. Nothing seemed familiar to me. The saying that says: "things look totally different when you come back than when you go" is a great truth. I stopped and tried to find my own tracks, which is not easy at all when the sun shines on a swampy cedar forest¹⁰. When I had found them, they seemed to go in all directions. It was getting late. My breathing, hitherto calm, quickened a little. When you're in a tangled cedar and alder swamp forest¹¹ and you're not sure which way to go to get out of there, you start to worry. I headed in the direction I thought was the one I'd come from, not realizing it was exactly the opposite way I wanted to

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out*, page 237).

¹⁰ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

¹¹ For example: "In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined." (*Earth's Revenge*, page 166).

go, and struggled through the swamp under the alder canopy. My face and arms were scratched, I was dripping with sweat, I was knee-deep in mud with every step, and I was totally confused. I must have lost all notion of time and space, but in the end, fortunately, I reached a forest track.

During this period, which I consider to be the first moments of my attempt to adopt a primitive way of life, I had what I call "the shaman complex". The shaman or healer is a part of native cultures glorified and emphasized in the mass media. So I, like many others I know, was quite influenced in this regard when I started learning about the primitive way of life. In other words, learning about all the plants and their medicinal uses seemed paramount to me and was at the top of my list of things to learn. This is not a bad thing in itself, if one does not stop at it. Learning that made me wander through forests, meadows, and riverbanks and allowed me to become familiar with the wild. My first summer I learned about a hundred plants and their medicinal uses (one only needs to know a half dozen or so to treat most medical needs from bee stings to cuts and bleeds to colds!). I do not want to imply that I look down on those who are dedicated to healing with plants. In fact, I'm still interested in helping to heal.

In the middle of my first winter in the North Woods, I met a woman who had Lyme disease, a terrible and debilitating disease spread by deer ticks. We became friends and I wanted to help her in any way I could. Since she had to spend many days in bed, she asked me to move into her house and take care of her. I told her I would. It was very hard for me to see this person wasting away despite everything I tried to do to help them. The mythical aura surrounding the "shaman" deflated and I learned a lot about myself and the fragility of human life. Being a healer has nothing to do with drums, rattles, or chants, or even how many herbs you know. In fact, this woman was helped more by my mere presence, offering her a helping hand, listening to her and letting her know that I cared about her, than the herbs I gave her. I no longer have the "shaman complex". I have realized that we all have a unique potential to help and heal through our presence and support.

He had been away from civilized ways of life for a year or so, and he missed being with others who also wanted to live in a primitive way. I had kept in touch with a few friends I had met the previous summer at survival school. We had been toying with the idea of creating a community based on primitive ways of life. After detailing where we would place a primitive camp and agreeing on some basic premises, a tribe was born. When it comes to a tribe or community, the saying that "the whole is greater than the sum of its parts" is very true. We had been able to break with civilization on an emotional and mental level, but now we were trying to do it on a physical level by living the old-fashioned way.

But what does it mean to lead a primitive way of life? Sleeping in a conical birch bark hut, wearing clothes made from deer skins, making and using your own tools, traps and weapons to stock up on meat, and the rest of the various aspects that life in

the wild entails?¹²[xii]? In the following pages I will detail my experience when living close to Mother Earth. Again, it will not be a bucolic story, but rather something full of concessions and difficulties, but also of satisfactions and joys.

I am not claiming that I know everything about primitive life or survival and have not lived this way long enough to be 100% capable and self-sufficient. However, I have learned a lot and I want to share it. Mainly, I want to comment on the many unforeseen mysteries that one has to solve and understand before one can go further. I have called this "the journey from civilized chaos to primeval paradise."

The move to Northern Michigan was my fifth move in a year. As you can imagine, my material possessions were minimal. If you have to carry them, the fewer the better. Less baggage, more freedom. The objects that are needed to live in a primitive way are scarce.

I got together with my friends and was delighted to be a part of this new tribe/community. To my way of thinking, this is the real beginning of adopting a primitive way of life; some kind of family A couple, another bachelor and me. Although one can get off to a good start living primitively on one's own, human beings are made to live together, and having companionship and support is a distinct advantage.

I've heard that in survival situations there is a hierarchy of needs: warmth (including clothing), water, and food. This hierarchy can also be applied to a primitive camp already set up; though shelter, water, and food all interact anyway. We knew where we were going to get water: at a freshwater spring three-quarters of a mile¹³ away. And we had been working on tanning deer skins with brains¹⁴ to make clothes. We collected wild edible plants, but we would have to wait until the fall before we could legally hunt for meat. This, coupled with sleeping in tents (polyurethane's bane), made me put building semi-permanent primitive shelters at the top of our list of priorities. It is not an easy task, as you will see, since it involved a series of facts and commitments that we had to accept when the time came. One of those facts is that most of the land in this country is privately owned, and what is considered public usually carries strict limitations. For example, the state forest that is behind our house (it is actually in

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

¹⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

front of it, because the gate faces it)¹⁵ is highly controlled. Theoretically, if you get caught picking up even a single twig, you could be fined or lose your permit (hunting or trapping, for example). So you are very limited in deciding where to set up your camp. We gave preference to being near the water. Since we did not have enough money to buy land, we settled on the land of the parents of one of the community members. This in itself is a concession, as we agreed to work part-time remodeling a house in exchange for being able to stay on the land. But it turned out well, since we were paid for the work.

Of course, we wanted to build our shelters with the materials that we collected ourselves in the forest. Materials that would serve to make an effective shelter to protect us from the inclement weather of northern Michigan. Temperatures ranging from several degrees Fahrenheit below zero to over 100 degrees Fahrenheit¹⁶, and all the snow and rain one could want. The soils here are sandy and there is not much humus or clay. We think, like most subarctic tribes, that using birch bark would be ideal. It takes about 40-50 good pieces of bark (depending on the size of the trees) to cover a 12 foot wigwam or cone hut¹⁷. We applied to the forest service for a permit to collect the bark from several birch specimens that were already marked for felling. We had to borrow a van to transport the bark. It took us three trips (three full days) to collect the bark and bring it to where we were going to use it. Some of the bark pieces we sewed together with spruce roots, to get panels. Others we place individually on the structure of the cabin.

Generally (and I emphasize generally), one cannot improve what has worked effectively for the indigenous people for thousands of years. We would check it on this occasion and on some others; often the hard way. The shelter was just the first example. We invested more energy than you can imagine trying to build the “perfect primitive shelter”, only to end up reverting to the basic design.

As I write this, it comes to mind how easily we often forget that a primitive person had to make do with their own tools; that is, tools of wood, bone and stone. It is amazing how quickly one can destroy and take the wrong path with the white man’s axes, shovels or hacksaws. Before we decided to collect birch bark, we had tried to

¹⁵ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “...it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁶ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*”, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

build earthen huts; basically underground shelters. Now it seems unbelievable to me, but we dug a hole 4 feet deep by 16 feet in diameter (in gravel and sand soil), using steel shovels. We take as a model of the structure the earth huts of the Mandan¹⁸ (which are no deeper than a foot). We had cut down huge lupulin hornbeams¹⁹ with steel axes to make beams and columns and were trying to figure out the best way to put the roof beams in place. It was becoming increasingly clear that the sheer amount of materials we would need to build the cabin would be prohibitive. Also, we were beginning to wonder about the safety that the final structure would offer, knowing that tons of earth would be pushing it in all directions. We were trying to live in a primitive way with the mentality of the white man (read civilized).

After some thought we decided to try what was originally used in that region, conical huts and wigwams. We decided that we would build one of each type and thus see the advantages and disadvantages of each. We started with the wigwam, however the dirt hut idea was still on our minds so we decided to make a conical hut 10ft (in the end down to 9ft) in diameter inside the huge crater we had dug and then accumulate the removed soil about 4 feet around the hut.

We liked the idea of trying to collect the materials for our shelters in the surrounding area and asked the neighbors for permission to cut down some lime trees²⁰ and ash trees²¹, since we thought we could remove the bark and use it instead of the birch one, because there were no birch trees in the immediate vicinity. Since we only had a few trees that we could use, we wanted to cut them down to get as much bark as possible. Cutting down thick 60-foot trees is no easy feat, and we almost killed ourselves trying, even with the help of a hacksaw and metal axe. I think the trees were trying to tell us something, by the way they fell. The first 5 trees were "hanging" from other neighboring trees. Some of the trees were split lengthwise when they fell (a very dangerous thing

¹⁸ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

¹⁹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²⁰ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²¹ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

when felling trees). After cutting down seven trees, the message was beginning to be clear: the natives rarely felled trees thicker than a forearm; firstly, because of the risk to their lives and, secondly, because of the energy expenditure that this entails. We accepted it and for a time we called our tribe "The Little Trees" as we swore not to cut more than branches and saplings no thicker than a forearm.

We had collected a fair amount of linden and ash bark. Lesson (learned the hard way) #179: Linden bark cracks, frays, and twists terribly when it dries. It sucks for making shelter covers. The ash one also cracks and twists, although much less. It soon became very clear what the natives were using: birch bark. Birch bark is tough, doesn't rot, is waterproof, and it's pretty, too. So in the end we gave up and asked permission to collect birch bark. If done properly, it won't kill the tree, as long as the sun doesn't hit the inner layer of bark that is exposed by stripping the outer bark.

The wigwam moved on, with only a little difficulty in keeping the bark tight against the curved roof. Putting the bark on the conical shelter was even quicker. However, we needed forty strong poles to build a structure that would support the weight of the earth piled on it. As you can imagine, there was hardly any room left for the smoke outlet hole. It was quite difficult for the smoke to get out and it was quite difficult for us to breathe. Furthermore, the protruding ends of the poles collected a considerable amount of rain which dripped onto us and our beds. We soon discovered that if we didn't want rainwater pouring into our cabin, we would have to dig a driveway sloping down and out from the door. I have to add that building this is a huge headache.

In the middle of September, it began to freeze. I began to notice that in the mornings, it was warmer outside than inside our cabin. I realized that we had built nothing more than an elaborate refrigerator, which was also sodden, smoky, and too cramped for two people. Believe it or not, we endured those conditions for over three months, despite the fact that it rained almost every day.

Finally, we said "enough" and decided to dismantle the failed experiment and build a normal conical hut on the ground (not in it). We made it 12 feet in diameter, instead of the 9 we had been living in. We only need 13 forearm-thick yards for the frame. Amazingly, we dismantled the old cabin, moved the materials to an area of red pine trees²² to protect them from the winter wind, and built the new cabin in just one day. The new hut has almost twice the area, smoke rises quickly through the hole in the roof, and is so well lit that even the smallest print can be read inside. It's dry, it's warm and it's pretty. It seems to me that the natives already knew all this...

Another aspect of primitive life that I have been thinking about a lot is food. Nutrition, diet, and ways to obtain meat and water have all been topics of heated discussion in our community. Of course, clean drinking water is essential for maintaining health, as well as for bathing, cooking, cleaning dishes and pots and pans, and washing clothes, as well as for soaking deerskins²³. Since we don't live by the water, we have to walk

²² "Red pine" in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

²³ Page 114.

a mile and a half to get it, and the river is about three miles away. Living this way teaches you that water is valuable and should not be wasted. Walking to the river for a swim is pretty tough when the temperature is 100° F and the weather is wet, as the walk back spoils what the journey was intended to accomplish. I quickly realized why the native people chose, whenever possible, to set up camp by a lake or river. Without a water source, washing oneself and one's clothes and getting drinking water become very difficult tasks.

Another proven fact is the difficulty of obtaining enough wild food to be able to live here in the 20th century. There are three basic facts that directly limit the hunter-gatherer diet: (1) the large amount of private land, (2) the strict closed seasons on hunting and trapping, (3) the strict legal regulations regarding to hunting and trapping methods and to catch quotas. And what about plants? Well, getting fresh wild vegetables in summer is easy and enriches the diet. I was a vegetarian, but that's practically impossible to maintain if you lead a hunter-gatherer existence. The best food to live on in the north is meat, and the more fat it has, the better. I've learned that it's possible to live quite well on spruce needle tea and meat, as long as you eat the whole animal. Eating the viscera and the eyes provides significant amounts of minerals and vitamins A and C, which are difficult to obtain in winter.

Due to the limitations I just mentioned, I had to buy about 50% of my food. I'm learning ways to make bushmeat less necessary in the diet, one of which is to make a brothy stew and add some root vegetables to it, or squash and rice occasionally. If you add a beaver tail, you get a good part of the necessary fat, and it is also very tasty!

I have tried to live on civilized food, like rice and beans, peanut butter, oatmeal and the like, but I felt that my energy level was very low. I have had to eat wild meat to stay healthy and strong and keep my body temperature regulated during the cold winter months. This means that I am a "reformed vegetarian" who eats only a small amount of plant foods.

Due to this change from vegetarian to carnivore, one of the things I had to learn to accept is the fact that I would have to kill for meat. I certainly don't like the idea of letting someone else do the dirty work and buy the meat. Anyway, most domestic meat is practically poison. I had to face the facts and psychologically adapt to killing other living things. This wouldn't have been too difficult for me if I hadn't had anything else to eat. However, in summer I ate well and therefore it was very difficult for me to think about killing. It seemed to me as if any other creature was out there looking for its life to survive and that I had no right to send it to the other world. The more I got closer to nature, the more I began to understand that all this has nothing to do with rights, but with the cycle of life itself. Life feeds on death, whether you are a vegetarian or eat meat. I developed a sense of respect for animals as I hunted and trapped them for food. A feeling such that it makes me feel disrespectful not to use the whole animal.

I remember the anecdote that made me cross the limit. He had dried a considerable quantity of crab apples, and had tried to keep them out of the reach of rodents. After

returning from a two-day hike, I discovered that they had been eaten by chipmunks²⁴. That was the straw that broke the camel's back! I set up two traps and became a killer. It was not something as ruthless and cruel as it might seem. If properly set, traps and snares kill the animal quickly and humanely and without the animal realizing that it has been trapped by humans. They may think that they have been caught between the branches of a bush, in the case of ties. And in the one with the traps, they never know what hits them, since it only lasts a second. Using snares and slab traps²⁵ is illegal in Michigan, and most other states, but handy with them to catch small game (chipmunks) so be prepared if you ever have to use them larger scale. Slab traps work on both a mouse and a bear and snares on both a rabbit and a moose.

I am often asked if I miss soda, candy, or pizza. Not currently, but when I was starting out, I sometimes had cravings. Honestly, I couldn't drink a soda anymore, due to the strong sweet taste of it. Crab apples, blueberries, raspberries and strawberries are natural sweets and enough to keep me satisfied. I don't usually miss salt either. Most of the stews I make are without salt or spices, and they still taste good.

I want to say something about the variety of foods. Last summer, I got sick of eating peanut butter and cheese sandwiches, and by fall, I could barely swallow black beans with rice. Ever since the trap season started and we had beaver to eat, I never noticed that I was eating beaver stew three times a day. It's good!

The variety of foods is quite limited in the primitive diet. This does not mean that it is not a good diet. Studies of primitive peoples throughout the world prior to contact with civilization have found that such "limited" diets can meet the needs of anyone. Weston Price's book *Nutrition and Physical Degeneration* concludes that these primitives had incredible stamina, upright postures, and cheerful personalities. He has found that their bone structure was excellent and their jaws and teeth were well developed and free of caries. In case after case, Price found no incidence of cancer, ulcers, tuberculosis, heart or kidney disease, hypertension, muscular dystrophy, sclerosis, or cerebral palsy.

Price also comments that in these early societies there were no psychiatrists, no crime, no prisons, no mental illness, no alcoholism, and no drug addiction. All babies were raised by their mothers, and there were no cases of neglected babies. In other words, physical health went hand in hand with mental and emotional health.

The Hunzas, who live in the Himalayas, were studied by an English doctor named Robert McCarrison. The results mirrored those found by Price. It was said that a Hunza messenger could carry a message to a village 35 miles away and return in the same day without showing any signs of fatigue! Other groups of aboriginal peoples studied by physicians during the period before their contact with civilization confirm Price's findings.

²⁴ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²⁵ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

Of course, we all know only too well that the modern diet and lifestyle produce exactly the opposite effects to those found in primitive peoples.

Another question that I am often asked, especially by girls and women, is “where do you have the bathroom?” I think they are trying to politely ask me what is used instead of toilet paper. Well, hygiene in nature is very important to stay healthy, and like all other things, mother nature provides all the necessities. Dry leaves from the forest floor work quite well, and *Sphagnum* moss (which has antiseptic properties) is even better. The snow serves during the snowy season. After going to the forest every day to relieve myself, I can say that I find most other bathrooms or latrines smelly and unsanitary. Also, when I “go to the forest”, I am closing the loop, giving something back to nature, so to speak. Actually, it can become something of a ritual.

When you live in the forest, hygiene is an important factor in your overall health. Keeping the campsite clean and tidy and keeping yourself clean is a priority.

Having a nearby river or lake for occasional bathing during the hot season is refreshing and also makes it easy to wash pots and pans. We have a sauna²⁶, where we periodically take steam baths. This is great for removing dirt and oil from the body and hair and also helps remove any toxins from the skin. I have never felt cleaner or fresher than after a steam bath.

Since I have broken the “civilized” habit of taking daily showers using synthetic soaps and shampoos, my hair and skin are much better. No more itching caused by dry skin. In fact, taking daily baths removes the fats from the skin that are necessary for the formation of vitamin D in the body. In any case, body fats and odor seem to stabilize after a few months in the woods. Waiting for the greasy hair to “stabilize” was hard, but since it did, my hair has been very healthy.

There are quite a few myths, perpetuated by modern civilized people, about our primitive ancestors. They are often applied to me when the topic of “what will you do then?” Them: “Don’t you know that those people died before they reached 40?” Me: “I seriously doubt the human species would still exist if all people had died so early; And even if I had, I’d rather live a free and fulfilling life in nature and die at 40 than live a hopeless, empty, isolated existence until I’m 80.” Them: “Your teeth will fall out and you will get cataracts!” Me: “My teeth have never been healthier especially since I don’t eat crap, and my eyes...I’ll drink some willow tea which is supposed to prevent cataracts.” Them: “It must be miserable living in a teepee²⁷ in winter, so cold!” Me: “Yes, it’s cold, but I feel strong and great in my teepee. Fresh air in my nostrils always, a nice warm fire with meat cooking on it, looking at the stars as I lie there waiting to fall asleep. Nope! I wouldn’t trade life in a teepee for any house.”

I could go on talking for years about the myths that fill our minds regarding natural life. I have had to directly confront my own doubts and myths. I believe that most

²⁶ “Sweat lodge” in the original. *N. from trans.*

²⁷ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

Aboriginal people lived long, healthy and happy lives. Surely they had difficulties and sorrows. If there were not some adversities and there were no struggles, life would not be worth living. How else would one learn about the right and wrong way of doing things?

Modern society and its disdain for the primitive always exceed what is reasonable. It's impossible to hide from his accusing finger and I'm often reminded of the Greg Brown song "Ain't there no place away..."²⁸. I can't say exactly how, but fear and misinformation have generated a gigantic monster made up of regulations, laws, and codes that may be putting off potential little cousins I've already talked about legal limitations when it comes to hunting and trapping Agents of the Department of Natural Resources[28] So armed to the teeth. I may be a bit paranoid, but after we built our cabins, it seemed as if the air traffic had increased immensely just above our camp. Was it just pilots looking around or was it some kind of Surveillance by government agents? On several occasions we have had groups of F-16 fighter jets almost skim the treetops above our cabins.

It is not only the fact of being Tigilado or the regulations regarding hunting that annoys me, there are also the laws about TiTienda and the nightmare of urban planning regulations. Some friends of mine, who were in a wigwam with their children, were threatened by the One Tez welfare services that the children would be taken away from them unless they moved to a house that met the legal requirements for Tienda Tienda and town planning. This means they had to have roofing felt, a wooden floor, a closed stove, and a thing called a "rat wall"²⁸.

There is an immense need for education about this matter of the early Tide. History classes in the United States are already incorporating lessons about Tida modes prior to contact with Europeans. I have started going to elementary schools to talk to the children about what the primitive Tida is like and to teach them how to make fire or ropes; the things that I use in my daily Tida. The children really show interest and ask a lot of questions. Adults are also interested. A lot of them, I suspect it's because they're intrigued by the Tida style I've brought. Just yesterday, my mother told me that she had been to the dentist (the same dentist I used to go to when I was a child) and he asked about me. When my mother told him how TiTía yo, he was dumbfounded and excitedly told her that he had always wanted to do something like that (ie TiTir in the wild). With adults, the most common response is usually "you're going to freeze to death" or "wonderful, I think I'll give you a Tisita to check."

The presence of modern society is a reality that I have had to face, not only temporarily, but also permanently. Right now, neither I nor anyone I know can TiTir in a 100% primitive way. I think it will be possible in the future. But now, there are taxes on the land (the community recently bought a piece of land with a river flowing through it!), car and insurance costs (very expensive), and extra food costs. I've been

²⁸ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

doing some part-time construction and masonry work to pay for those expenses, but I'm still wearing a primitive Tida mode almost all the time. I have started giving talks and courses on Tida natiTo mode in schools, for a fee. This is another way to earn an income to the complexion that educates other people.

I'd rather share with others the knowledge of how to make something (i.e. make a bark basket, tan a hide, etc.) than make those things myself and then Hand them over to someone who will hang them on the wall of their half million house of dollars.

When I first embarked on primitive life, I wanted to be able to live without ever using a car or extra food. But for now, the reality is that I need income, just a little, to meet some needs.

The land issue is also very important. We as a community did not like (and still do not like) the idea of "owning" the land. And there are only the following options: to be a nomad in the public forests²⁹, to buy land or to have a generous relative. Although being a nomad on public land has its advantages, for now having a permanent home and not having to worry about harassment from agents of the Department of Natural Resources and the Forest Service, is the best option. After searching for a while, we found a great little parcel for sale in the wildest part of the Midwest, surrounded by public forest. It has a ravine and a river as well. It looks like paradise to me, and I intend to move there soon (June '96). Of course, the bad side of the matter is that I am in debt as a result of the purchase of the land. That means working more outside. This usually means everything from part-time work in masonry and renovations to giving talks and courses on native life in schools. We hope to be able to give courses to the general public soon.

Some people are disappointed when I tell them that I drive a car from time to time, or that I don't get all my food from the wild. They have an idealistic notion of living with nature. It seems that I deviate from the image that they have of what an authentic "Indian" is or should be like. Before I really became primitive, I too had an unrealistic vision of what it would be like to live primitive.

At present, there is no clear and precise line that separates modern life from primitive life. It is a great naivety to believe that you can go from one world to the other completely in one fell swoop. Due to the amount of skills and knowledge that it takes to live in the wild, I have to be patient and take the time to learn. Not always seen in suede clothes³⁰. I use iron pots for cooking until I learn how to make acceptable clay pots. I own and drive a car to get to certain hunting areas and schools, to visit my relatives, etc. When the time comes, I hope to be able to use a canoe or walk almost everywhere I need to go. I use woolen blankets and a sleeping bag until I have enough tanned hides to make myself a comfortable bed. In other words, the transition from modern society to a primitive lifestyle is just that, a transition. I have had to depend

²⁹ "National forests" in the original. *N. from trans.*

³⁰ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

on certain products that do not come from wild ecosystems to survive. I am insisting on all this because I want to emphasize that this transition takes a long time, time to learn techniques, time to heal from the damage caused by life in modern society, time to overcome insecurities, time to adapt to great changes in the way of life. There is simply no cultural environment to help us follow the “path of wild nature”³¹. We have few (if any) veterans to learn from. We have been schooled and prepared from birth for the fast-paced world of business, not the aboriginal world of hunting and gathering. I have to try not to be too critical of myself to avoid getting discouraged and to be as strong and patient as possible.

I hope this lets the reader know that there is no quick and easy way to achieve a primitive way of life once you have quit your job and sold your house etc. What has encouraged me is knowing that all of our ancestors (more than 99%) were hunter-gatherers. That is our true heritage. As I’ve gotten closer to a 100% primitive way of life, things seem to be getting easier. Ideas come faster. A real image of the whole cycle is created that represents living in a primitive way. I have had, and continue to have, the perseverance to believe that it is possible and that I can do it.

I guess there are levels of freedom nowadays. In my opinion, going back to the primitive offers the greatest possible freedom. Sometimes, it makes me happy and it definitely fills my life. My life belongs to me. If I want to go explore a new wilderness, I go. If I want to go beaver or deer tracking or whatever, I go. If I want to just sit and spend half a day in the sun by the riverside, I can do that too. I have great flexibility in what I can do and when. This is part of being free, I think.

Another aspect that I have noticed is a change in the notion of time. I am relaxed and without rush or stress that make me go to beat the clock. As I have slowed down, I feel like I have more time! A wonderful paradox, right? I think less about the future and live more in the present moment. Time seems to have stretched out and expanded, so to speak. I feel more integrated into the natural flow of life. I think this is also part of freedom. Living in the present moment is not something that I have consciously tried to achieve, but it is happening gradually and naturally as my time living in the woods increases.

I said that I would end this article by talking about two aspects of primitive life that are not found in survival manuals, although I consider them essential to long-term success in living in the wild. They are (1) the community (ie family, tribe, friends) and (2) the attitude.

Community. In my opinion, this is the main thing. A group of people with common goals and shared interests is a very powerful thing. They become brothers and sisters, and they care about each other. If someone is injured or falls ill, the rest of us help

³¹ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

them. If someone is down or depressed, we chat or play music. If a shelter has to be built, we all help. If someone kills a deer or hunts a beaver, share the meat with everyone.

Being part of a community is also like a mirror to see yourself. We realize that each one of us comes from a disastrous society, that we each have our defects that we have to polish. We don't always agree on everything in our community, and that's a good thing because it forces us to think twice and discuss things together.

I'm thankful for the community we have, even though it only has five members now. I hope others can be formed in the near future.

Attitude. It can help you or sink you. It's important to be very knowledgeable about techniques like knowing how to make fire, but if you're caught in a storm in the rain or a blizzard of snow or whatever, and you let the weather affect you psychologically, that could mean hypothermia. I am learning that I need to have confidence and courage to live the way I have for the last two years. Many doubts about what I am doing have invaded my mind. I have had to scare them away, overcome fears and convince myself that I can do it. If I fail, I try again. I can't give up on something if I want to continue living in a primitive way. There is much to learn. An old sage said, "When you get up in the morning, cheer yourself up. No one else will do it for you, so you have to do it yourself."

A sense of humor is a very important part of a correct attitude. Mine can get very sarcastic at times. I face setbacks and concessions with humorous comments. Being able to laugh at myself (I do often) helps a lot. When things don't go as planned, I can either break down, blame someone, or laugh at myself or the situation. Having been through everything I've been through, I can say that laughter is indeed the best medicine. When I started to lead a free lifestyle, my personality also became freer.

I really hope I haven't been too heavy-handed about the trade-offs and difficulties of going primitive. It is difficult to describe the magnitude of the sensations of freedom and the impressive sights, sounds, smells that invade my senses in the forest. The satisfactions and rewards of this kind of life are not things that can be understood simply by talking or reading about them, but must be directly experienced by oneself. So get out there. Experience it and live it!

It has been a pleasure to share with you some of my experiences over the last few years on my journey to a fully primitive way of life. I hope I have encouraged many of you to break with modern existence. Maybe we'll meet some day.

Presentation of "CONSERVATION AND SUBSISTENCE IN SMALL-SCALE SOCIETIES"

The main value of this article is that it dismantles the myth that small-scale societies (bands of hunter-gatherers, horticulturist tribes, nomadic herders...) are Nature conservators. The cases in which conservation ethics and practices can be found in this type of society are exceptional, according to the authors.

One of the most serious defects of the article is that it tries to deny the concept of climax in ecology with the excuse that ecosystems evolve over time. The authors propose the "ecology of the absence of equilibrium", that is, an ecological relativism. The fact is that they start from theoretical assumptions that even they do not believe, since they contradict each other at least three times throughout the article (when they speak of a key predator, of grasslands as forest degradation and of species characteristic of the phases of ecological succession).

On the other hand, reading it may raise interesting issues, for example biodiversity. Today it is fashionable, everyone is talking about it. The fact that diversity (cultural, ethnic, political,...) is a very important value of techno-industrial society has facilitated the expansion of the term "biodiversity" in society. It has permeated society so much that it even works as a tourist attraction. All regions boast of their high biodiversity to attract tourists and all natural parks want to have a lot of biodiversity, even if they have to use machinery to do so (maintain meadows, for example).

High biodiversity is supposed to be a sign of ecosystem stability and health, but this is not always the case. We have a good example in the Iberian Peninsula, it is considered to be one of the places with the greatest biodiversity in Europe. Although there is a high diversity of species and habitats, as there are no large wild areas, large predators have great difficulty in subsisting. Wild nature is one thing and biodiversity is another. There are other areas in Europe that are wilder and where some of us would prefer to be, even if they are less biodiverse.

Obviously, there are wild ecosystems that have a very high biodiversity, for example tropical forests. In this case there is a correlation between high biodiversity and wild nature. However, there are other wild ecosystems (certain types of forests, for example) that have less biodiversity, but that have the same intrinsic value, precisely because they are wild. In short, what has intrinsic value is wild Nature, not biodiversity.

The authors defend the positive value of the effects of human beings on ecosystems because making a clearing in the forest improves biodiversity. However, later they say that the prairie is a degradation, so what are we left with? Is it something positive that enhances biodiversity or is it something that degrades? The argument that it is something positive is put forward today to justify the dehesa and other anthropized ecosystems. They do not realize that if there were, among other things, large masses of wild herbivores in Europe, as there were thousands of years ago, there would be no need to maintain meadows (either by machines or by cattle) as is done today. On the other hand, species emerged (we refer to the speciation process) before the anthropization of ecosystems, therefore human intervention is not necessary to keep these species alive on the face of the earth or "to create biodiversity", wild nature is enough and is left over. Not all places have to have a very high biodiversity.

Another interesting question related to the previous one on which one can reflect is the interaction of the human being with the ecosystems. If you want to offer a positive ideal (hunting-gathering) for a movement contrary to techno-industrial society, it would not hurt to reflect on this question. What kind of companies would they be? With what mode of production? What is ethical? Just nomadic hunter-gatherers on foot? Using the terminology from the article, what degree of *ecosystem engineering* is acceptable?

As is often the case, authors have very different values than *Indomitable Nature* has. Not only because they try to discard the concept of climax or because they take biodiversity as a reference, but also because the important thing for them is the people, not wild nature. They are also progressive, and use the concept of "ecosystem engineering" to avoid distinguishing between the effects on nature of a hunter-gatherer society and those of a civilization.

CONSERVATION AND SUBSISTENCE IN SMALL-SCALE COMPANIES[a]

Eric Alden Smith
Mark Wishnie

INTRODUCTION

The idea, which started several decades ago, that indigenous peoples and other small-scale societies were exemplary conservationists has become widespread in the popular media as well as in academic circles.¹ This indigenous conservationism has often been attributed to a spiritual respect for and practical understanding of the natural world (eg, Vecsey 1980, Martinez 1996, Berkes 1999). The evidence presented in defense of this

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

idea includes the cultural expression of a conservation ethic, animist religious beliefs that conceptualize other species as social beings, the high levels of biodiversity found in the places where these peoples live, and the impressive environmental knowledge they own (Nelson 1982, Durning 1992, Posey 1992, Gadgil *et al.* 1993, Callicott 1994, Alcorn 1996, Bodley 1996, Nabhan 1997).

Although this view remains widely accepted, it is increasingly being challenged, both in the popular (eg Diamond 1992, Redford 1991) and academic literature. Much of the evidence cited by these critics is archaeological (Stahl 1996, Redman 1999) or ethnohistorical (Kay 1994, Krech 1999), but some is based on contemporary field studies by ethnographers or biologists (eg, Stearman 1994, Alvard 1998b, Fitz Gibbon 1998). Specific examples of non-conservation behavior by small-scale societies (SPEs) include anthropogenic faunal extinctions and habitat degradation, as well as subsistence behavior patterns that seem to correspond more to economic optimization than resource or habitat conservation. Furthermore, some anthropologists have questioned the causal efficacy[b] (Hames 1987, Low 1996), or even the very existence (Bulmer 1982, Brightman 1987, Carrier 1987, Krech 1999), of the conservation ethic in indigenous peoples.

[a] Translation by A. G of the article "Conservation and Subsistence in Small-scale Societies", originally published in *Annual Review of Anthropology*, 2000. 29:493-524. *N. from t.*

[b] The incidence of legal norms in determining the behavior of individuals is called "causal efficacy". In this case, the authors refer to the fact that some anthropologists have questioned whether the possession of a conservation ethic actually generates conservationist behaviour. *N. from t.*

This debate has become politically charged because criticism of indigenous conservation is sometimes seen by those working for indigenous rights as attacks on their efforts to defend local control of resources by indigenous groups (Alcorn 1995, Posey 1998, Sponsel 1992). Critics often respond by defending indigenous land rights, arguing that those rights will eventually be undermined by misguided or naive ideas about indigenous conservation (Hames 1991, Stearman 1994, Vickers 1994, Hill 1996). For these and other reasons, the SPE conservation literature is often polarized into dichotomous views, presenting these peoples as either "guardians of the land" (Durning 1992) living in harmony with pristine environments until invasion by destructive external force (agriculture, industrialization, capitalism), or else as "primitive polluters" (Rambo 1995) with a record of environmental destruction going back to the "Pleistocene slaughter" (Martin 1993) of which the first peoples of America (and recently those of Australia) are accused.

With the accumulation of considerable empirical evidence on this issue, plus the development of a coherent body of theory that can guide the collection and analysis of that evidence, there is now the possibility of presenting a more balanced and less passionate assessment of indigenous conservation, moving beyond caricatures, pejoratives such as the "noble ecological savage" (Redford 1991). In this spirit, Krech (1999) and

Redman (1999) have recently reviewed the archaeological and historical/ethnohistorical evidence. Here we focus on contemporary field studies, analyzed in light of relevant theories from various disciplines.

The remainder of the article is organized as follows. We begin with a summary of the ecological and evolutionary context in which the environmental relationships of SPE take place, these relationships include evolutionary traits that favor dispersal capabilities and colonization of new habitats and what some scholars have called “ecosystem engineering”. We then summarize theory concerning environmental conservation and utilization from different disciplines, emphasizing issues such as sustainability, delay avoidance[c], collective action, and common property resource management. These contextual and theoretical sections provide us with a foundation for reviewing the ethnographic arguments and evidence related to conservation in SPE.

Presentation of “ENTER IN CONFLICT”

It is not uncommon to hear or read that war did not exist among primitive peoples; that war did not exist among hunter-gatherers; that war conflicts constitute exclusive activities of civilized or modern societies; that primitive war was little more than a game that does not deserve to be called "war"; etc. The authors of the text presented below, SA LeBlanc and Katherine E. Register, try to dismantle all these myths, which they include in their book under the general name of the "myth of the peaceful noble savage", with numerous data extracted of the archaeological, historical and ethnographic record. And it is in this sense, as a source of empirical data, where the interest of this text lies mainly.

Apart from this, it is also interesting how the authors use the Darwinian notion of evolution by natural selection to argue their ideas about war in primitive societies. The authors apply the idea of natural selection to the interaction between human social groups, with results that, to say the least, give much to think about social theories based on the naturalness, superiority, convenience and/or greater efficiency of things like management, rational use of resources and behavior, cooperation, ecological awareness, pacifism, etc. To what extent these arguments by the authors based on natural selection are really valid is something that could be discussed at length (and that is in itself a good reason to include their text on this page), but it is clear that at least they expose the naive ideas about human nature, the evolution of societies and the factors that direct or should direct it.

Another point in favor of this text is the use that the authors make of some notions from the ecology or biology of ecosystems, such as carrying capacity. Many anthropologists, historians and archaeologists too often forget that human beings are just another animal species that needs to consume resources by extracting them from their environment and that this conditions the way and the degree in which human groups develop.

On the other hand, it should be noted that part of what the authors consider and present as indisputable evidence is not so much so (as the authors themselves acknowledge, despite using the term "proof" -"evidence", in the original- to refer to to them). Some of the indications that the authors present are just that, more or less probable indications that there was war in those societies, but not conclusive and certain evidence that there was. These indications could serve to reinforce in their position those who really already believed that there was war in the societies referred

to in the text, or even those who have certain doubts but are inclined to believe it. But they do not serve to dismantle the claims of those who believe that there was no war in those societies, nor to convince the recalcitrant skeptics who believe only what is empirically proven beyond all doubt.

Likewise, the authors gather in the same article data from nomadic hunter-gatherer societies, uncivilized agricultural societies, prehistoric civilizations, historical civilized societies, and even industrial societies. This is something that can be taken advantage of by those who do not want to recognize that war is as old as humanity to accuse the authors of lacking rigor or to disable a large part of their arguments (these are based on data from civilized societies, or too developed, so some could continue to argue that in less developed and complex human societies, such as nomadic hunter-gatherers, there was no war), although not all (there is even some data from nomadic hunter-gatherer societies in the text). . Although for this type of people there is usually nothing that lowers them from their comfortable "primitivist donkey", not even empirical data.

GET IN CONFLICT

By Steven A. LeBlanc¹

The Mimbres Valley, located in the southwestern tip of New Mexico, is a place of fertile fields irrigated by the small, clear Mimbres River, which flows from the northern mountains. The Mimbres people prospered around AD 1000, when there were more than a dozen villages and many small settlements located throughout the valley. The Mimbres people are known for their very peculiar pottery, some spectacular bowls painted in black and white. Typically adorned with intricate geometric designs or with paintings about daily life, they were used as containers to serve food and were often buried with the dead. The wickers buried their dead near their native homes, usually under the very ground on which they lived.

In the early 1970s, during the first of half a dozen campaigns we conducted on the Mimbres, our dig site was based in an old ranch house situated just above the river, directly next to a village. very large that had been settled over a long period about a thousand years ago. My team was starting to dig at the site of the large village, but we were still exploring the surrounding area. Several members noticed that directly across the river was a steep hill with a small , slightly flat area at the top. Out of curiosity, one day some members of the team went up the hill and returned to inform us that it contained the remains of approximately fifteen houses. The surface was covered with pottery shards indicating that some of the earliest farmers who lived in the valley must have settled there (circa AD 200).

¹ Translation into Spanish by Último Reducto of "Enter Conflict", third chapter of the book *Constant Battles: The Myth of the Peaceful, Noble Savage*, by Steven A. LeBlanc and Katherine E. Register, St. Martins Press, New York, 2003. *Translator's note*.

Hilltop settlements were already known in other parts of the Southwest², but were inexplicable to us. The first farmers living on top of high isolated hills? Why did they live on the top when they could have settled down on the slope, where we had set up camp? We were closer to the water and the farm fields, and our location avoided the steep climb that would have to be made to stock up on food, firewood, water, and everything else that this community of perhaps thirty to forty people would have needed.

Archaeologists had been racking their brains for years with these questions about “hilltop settlements,” and my team considered the question as we continued to dig. In the course of the month, we made a fascinating discovery: practically all the settlements of this same period in the Mimbres valley were located on promontories. Having discovered another settlement situated on top of a hill some seven hundred feet³ above the river bank, the rancher who owned the land we were digging on mentioned that lightning used to strike on that hill. They fell so often, he said, that he actually lost a cow every year to lightning on that particular promontory.

This information left us perplexed. These wicker hilltop settlements were not only impractical but also dangerous in this land of daily summer storms. After learning this, I began to suspect that the Mimbres people built these settlements on the tops of the hills because they were forced to. The possibility of a prehistoric war was right before my eyes. The hills must have provided their communities with strategic defensive positions.⁴ Suspecting that hilltop villages were fortifications is one thing, having hard evidence of war quite another. As almost always in archaeology, I needed to place this discovery within a larger context.

I began to study the work of other archaeologists and discovered that they too had found a good deal of evidence of war, although they did not always acknowledge it. The wicker settlements on top of hills were not the only ones. These early agricultural settlements from the period from 1000 BC to the first two centuries AD appear throughout the Southwest. Many of them are clearly defensive, both due to their location and the presence of low defensive walls. Archaeologists also find evidence of prehistoric warfare in this region in the form of massacres, scalping, and trophy headhunting. This type of evidence extends over a period of a thousand years ; even in a large area of the Southwest, dating to the ninth century AD, almost every excavated site had been burned; another indicator of the existence of intergroup conflicts in early times.

The prehistoric Southwest, long considered the home of the “peaceful Pueblo Indians,” had been roiled by war. Our wicker hilltop settlements were just one more example of this, even if they displayed only a few of the hallmarks of warfare. I began to think that if the Southwest had not been peaceful there was little reason to believe

² From this point on, whenever the author uses the term “Southwest”, simply, it is understood to refer to the American Southwest. *N. from trans.*

³ 1 foot = 30.48cm. *N. of the trad.*

⁴ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

that any other place on Earth had been so for a long time. The entire idea of a peaceful past was called into question.

So far I have used the term *war* in a broad sense, but before continuing this journey through the six million years of human history, I should clarify what I mean when I say “war”. Conflict between animals, especially chimpanzees, has the hallmarks of what I take to be war. In turn, not all human conflict is necessarily war. The word leads one to imagine conflicts involving armies with large pitched battles and professional soldiers, however, fights, ambushes and raids are also important. Many scholars define *warfare* in such a way that it refers to something that only complex societies using metal implements can carry out. Anything else—for example, an occasional attack—isn’t *real* warfare, according to them, but more of a game-like thing that doesn’t deserve much thought. This type of approach or attitude, however, confuses the methods of war with its results.

I think it’s more useful to approach the topic of war with questions like, “Does conflict between separate political units lead to a significant amount of death and lost territory, or does it result in some territory being left unused because it’s too dangerous to live in?” over there? Do these people spend a great deal of time and energy defending themselves? The answers to these questions reveal a very different concept of *war*. If a fight results in significant impacts on people, it is war regardless of how it is carried out. To understand it in any other way is either to sugarcoat or misunderstand the past. It’s hard to believe that the world was peaceful until someone in China or Mesopotamia forged the first bronze sword. Laying ambushes on neighboring villages and killing a few men and women with spears and stone-edged knives is serious warfare, especially if carried out on a regular basis. Cases of this type of ambush are known throughout the world and must have been the most common form of conflict in the past; so you should pay attention to it.

Not every form of conflict is war, and it is useful to make a few valid distinctions about conflict. For example, murder and fights are not war. Killing each other, a behavior not approved by society as a whole, is not war, although it must be admitted that the limits can be blurred.⁵ The frequency of fighting and the number of people killed on each occasion must be taken into account together – separately they are not significant in deciding whether or not there was a war. In some societies, such as those of the highlands of New Guinea or the Yanomamo of Venezuela, warfare was extremely frequent, with raids, ambushes, or battles taking place every year, or even monthly. Often these conflicts resulted in only one or two deaths in each incident. If you tally up the numbers over a person’s life span, you see that many of the adult males died fighting. The total of events related to the war, including attempts to defend themselves, reflects the intensity of the war.

The idea that there are some “fierce peoples” who are more likely to wage war and who are somehow different from the rest of the peoples of the Earth is widespread. The

⁵ Original title: *The Vanishing face of Gaia*.

southern Plains Comanche and Yanomamo have been described as especially aggressive and combative. Others, including the Australian aborigines or the Bushmen of southern Africa, have been considered more passive. These notions are part of preconceived myths about human conflict and are not based on real facts.

It is one thing to define war and another to discover it. It is not easy to see evidence of war in the past for various reasons. At El Morro⁶, the archaeological evidence of warfare was clear and unmistakable, with the massive fortifications being the most obvious examples. Archeology is not always so unequivocal. In trying to unravel our past, anthropologists and archaeologists face the challenge of piecing together piecemeal evidence from a variety of sources, and as with any puzzle, the process can be slow and tedious. Until very recently, many anthropologists and archaeologists preferred not to look for evidence of warfare or ignored it if they did find it.

Much of the available evidence was collected and interpreted by scholars who were often inclined not to recognize the war or its aftermath. Therefore, discovering war in the past is more difficult than it might seem at first glance. For example, a castle is easy to recognize as an object of war, just like a sword or a shield. But a bow can be used to hunt *and* to fight. When collecting information about people from the past, and when looking for evidence of war, the real problem is knowing what to look for.

One of the most obvious indicators of warfare in the archaeological record is the so-called "direct evidence of violence" that appears on skeletons. This includes arrowheads or spearheads embedded in bones or skulls with severe fractures caused by "blunt instruments." Such evidence goes back far back in time. The Shanidar cave site in present-day Iraq yielded several Neanderthal skeletons between forty and fifty thousand years old. Among them, one had a stone blade inserted between two ribs and another showed evidence of blows to the head. These findings probably indicate violence, although other explanations are possible. Other unequivocal evidence of warfare at this time is the fossilized human skeleton called Skhul IX, found in a cave in Israel. In this case, the individual was stabbed in the leg and in the pelvis, as can be seen from the damage shown to the bones, causing injuries that surely caused his death. This unfortunate person may have suffered other injuries as well, offering evidence of the classic type of war wounds commonly found among hunter-gatherers—first pinned down by an arrow or spear, then finished off with blows to the head.

Scalping, whether done with metal knives or stone tools, often leaves long, straight cut marks on the skull. Really, scalping is just one way to get trophies, and trophy headhunting was common in the past. During decapitation, the first two vertebrae would often remain attached to the head and thus would be missing from the body. When a skull has the first two vertebrae attached or bodies are missing skulls and the first two neck vertebrae, the likely response is deliberate decapitation. Such was the case with a batch of forty-eight trophy heads from fifteen hundred years ago discovered at the Cerro Carapo site on the coast of Peru. In a small cave in Kimboko Canyon,

⁶ Archaeological site located in New Mexico. *N. of the trad.*

near Marsh Past in northern Arizona, a trophy head was buried about 2,000 years ago as a burial offering alongside an adult male, about the same time as the fortifications in the valley. of the Mimbres, further south. The heads had been skinned and the skins carefully sewn and painted—so concretely molded and so similarly painted that the practice must have been widespread. Nearly identical looking trophy heads are depicted in nearby cave paintings.⁷ During this same time, scalping was common enough in the Southwest that a special type of basket weave was used to stretch and expose scalps. These hair-extending baskets have been preserved only because the caves in this area are very dry. In most of the rest of the world such ancient archaeological evidence would have degraded and gone undiscovered.⁸

Archaeologists sometimes recover bones that clearly show “stop fractures”—breaks that indicate raising of the arms to avoid a blow to the head. When an individual is about to be struck on the head, they instinctively raise an arm to cushion or “parry” the blow. The blow may well be strong enough to break or fracture the arm but not enough to cause death. After the fracture heals, the bone still shows signs of the break. Such a fracture could have been due to an accident, but the general frequency of fractured limbs can be estimated, and when stopping fractures are much more common than would be expected if they were due to accidents, we must draw the conclusion that they are due to battles. The tomb of the king who is known, according to inscriptions, as the founder of the ruling lineage of the Mayan site of Copán, was recently found and had precisely that stop fracture. Archeology suggested that the lineage had been founded by conquest and it is now clear that the king did not seize power peacefully.

Not all evidence of war is as unambiguous as these examples. We assume that cannibalism was practiced when human bones have been treated in the same way that people treat animal bones. In past times, in order to make the most of the animals, the meat was roasted, leaving charred portions of bone.

While the carcass was processed, the bones were broken to extract the marrow, then sometimes boiled as part of a soup or porridge. All of these forms of processing have been found throughout the world in human bones from various time periods.

Some societies eat parts of their dead relatives. Herodotus, the famous Greek historian, described this practice in the 5th century BC in Scythia.⁹ The practice is best documented among the Fore people of the highlands of New Guinea. Such consumption is related to the preservation of the spirit and the link between the dead and

⁷ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁸ An example: “*You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.*” (*Earth’s Vengeance*, page 38).

⁹ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

the living. This behavior is extremely rare globally. Most of the time that some humans eat others, they consume the enemies that have died or have been captured in some battle, either to feed themselves or as a ritual act. This practice has been confirmed throughout most of the world and in Europe as recently as the 17th century. Historical examples of cannibalism include modern cases in Spain, Poland and Bohemia and prehistoric examples are known in Europe, Indonesia (Dayaks), Polynesia (Maori), Melanesia (New Hebrides, Solomon Islands, New Caledonia, Fiji), Africa (Congo, Uganda, Ovimbundu¹⁰), South America (Amazon basin), Central America (Aztecs, Caribs) and North America (Iroquois). Some of this behavior is ritual and it appears that only minute amounts of human flesh were consumed. For example, among the Huron, the entire village would participate in the torture and execution of a prisoner, culminating in the collective consumption of the heart, so there would probably be no remains detectable by archeology in such cases.¹¹ When archaeologists discover signs of cannibalism, this too is almost certainly evidence of war.

Despite the significance of such "direct" remains, much of the archaeological evidence for prehistoric warfare has nothing to do with bodies. Fortifications are the most common and obvious sign of war in the past. Hilltop settlements surrounded by multiple walls, moats, and easily defensible gates are quite convincing. The number of such fortifications can be impressive. There are over a thousand hill fortifications, called *pa*, built by the Maori in New Zealand, and in England, the number of hill fortifications from the Iron Age (1st millennium BC) is several times said amount. The Great Wall in China and Hadrian's Wall in England are obvious examples of fortification, even though there are no written records of them. In Peru, there are also great defensive walls thousands of miles long, which must have been built due to the same defensive necessity. The bastions—outward-projecting parts of a fortification—are also revealing. When the walls are studded with towers or other protruding parts, the defenders can shoot anyone who tries to scale the wall. Such architecture leaves little room for doubt about the function of the wall itself. The oldest known examples of these walls are found in present-day Turkey and date back to 6,000 BC. These walls can be massive. Some walls that surrounded certain cities in ancient China were wide enough that a chariot with its horses could travel over them.

As I found out in the Southwest, villages or towns can be better defended if they are built on top of hills or on tight spots. "Control elevations" is a basic military principle. In many cases height alone was considered to offer an adequate defense. Many people all over the world instead of building defensive walls built their houses linked together so that the external walls of the connected rooms offered a continuous defensive wall. This type of defensive architecture can be found in Southwest Asia and the American Southwest. The famous Pueblos of the Tao, Acoma, and Hopi in Arizona and New Mexico were originally built in precisely this defensive fashion—although now

¹⁰ Bantu ethnic group from Angola. *N. from t.*

¹¹ A couple of examples:

that peace has settled in the region, those communities have expanded and no longer present a defensive appearance. . Many prehistoric peoples took these defensive tactics one step further. They located their communities close to their allies. Through the study of site maps and the mapping of settlement patterns over time periods, clear evidence of community groupings has been discovered. These "settlement clusters" are often carefully placed so that signals can be made from one settlement to another, presumably to summon help during an attack.

Often when communities are grouped together, the territory between the groupings becomes feverishly conflictive and therefore uninhabitable. These relatively empty zones, or "no man's lands", appear all over the world in societies of many different types and are clear evidence of conflict. Empty areas have been recognized in the Oaxaca Valley during the last few centuries BC, a time for which there is much other evidence of warfare. Such empty areas are found in the eastern United States in late prehistory and in the Nile Valley before the formation of the state of Egypt.¹² Sometimes many of the defensive features of prehistoric communities can be deduced without even digging.

When archaeologists excavate a site, they often find evidence of fire. Certainly, in the past houses were sometimes burned down by accident, but when entire communities of flame-retardant stone houses turn up ablaze, with all of the people's possessions still inside, suspect war.¹³ Fire is such a common act of warfare that in Mesoamerican writing the glyph for "conquest" represented a temple being destroyed by fire. Archaeologists also recover hoards of weapons—far more numerous than would ever have been necessary for hunting—or weapons that would not be useful for hunting. In an ancient Near Eastern settlement, a long wall was excavated through the village. Spaced along its inner face, bucket-sized holes had been dug into the ground, each one filled with hundreds of slingshots. This is not only a test of warfare but also of weapons storage in anticipation of attack.¹⁴

¹² For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

¹³ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹⁴ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly

There are shields and armor that were made exclusively for war. Metal aside, the variety of materials used in their manufacture is ingenious: plate armor made of bone segments sewn together like blind slats, made by Eskimo groups, both prehistoric and historical, who wore them under their parkas; long pieces of leather wrapped around the body, also in the Eskimos; and armor woven from strong plant fibers in New Guinea. Shields were not only made of leather and metal; shields resembling baskets three feet in diameter were woven in the prehistoric Southwest. When scholars look closely at these weapons and wonder why people like the Australian Aborigines, who had so few possessions, would have so many weapons of war—special spears, special boomerangs, special thrusters, and shields and maces that they used only for warfare—the importance of such weapons is evident. The amount of effort and the degree of dedication and skill invested in the making of armor and other war related items displayed throughout the world is often considerable. In fact, this difference in “tool quality” can be quite revealing. For example, if you make a digging tool and it breaks, you lose some time in the field. On the other hand, if your war mace breaks in battle, you may die. In North America, among the Plains Indians, the strongest and best shields were made from bison hide, but not just any bison. The hide covering the hump of a large male bison was carefully chosen. The skin was then slowly smoked for days to make it stiffer and tougher.¹⁵ Crafting weapons and armor of the highest quality could save a warrior’s life on the battlefield. Frequently, the archaeologist sees meticulous care and quality workmanship reflected in the manufacture of weapons. This is clear proof that these articles were dedicated to serious and deadly warfare and not merely ritual combat.

An unexpected line of evidence of war is the presence of unburied or improperly buried bodies. One of the hallmarks of humans is our almost universal need to bury or otherwise formally treat our dead. There are many different ways we humans care for our dead, but we all do something with them. We do not simply leave the body on the ground or throw it in a grave, nor do we treat our dead disrespectfully. When humans treat a deceased in this way, the body is that of an enemy or someone rejected by society. When archaeologists recover enough burial remains from a prehistoric culture, we can identify the normal form of burial. When we find bodies that deviate from this treatment in ways that we might consider disrespectful, we can suspect that the

respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (The Earth Runs Out, page 237).

¹⁵ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

cause is war. Hundreds of bodies dumped into pits, such as at the Crow Creek site on the upper Missouri River, or crammed into underground storage pits, or abandoned in places where their bones were gnawed by carnivores or rats, all of these cases they indicate that they are enemies, not relatives—or else, that there was a massacre from which no one came out alive to care for the dead properly. From time to time, the piles of bodies do show some attempt at funerary treatment. At a site in southeastern Utah called Cave 7, which dates to the same time as the wicker hilltop settlements and the Arizona cave trophy heads, nearly a hundred people were killed in a massacre. It appears as if someone tried to bury some of the bodies, but most were not buried and some still had knife points and remains of other weapons embedded in them.

Sometimes this disrespectful treatment represents human sacrifice, almost certainly of prisoners, as they were often buried with their hands tied, as was found at the Teotihuacán site near Mexico City.¹⁶ The center of this great city was dominated by several monumental pyramids and temples. Near the Temple of the Feathered Serpent, mass sacrifices of at least two hundred boys took place, probably in connection with the consecration of the temple. The bodies were buried in mass graves, in and around the perimeter of the temple. In these graves, many individuals were found with their arms crossed behind their backs, probably because their hands were tied.¹⁷

Visual art is another source of evidence of war. Rock art, painted and engraved on stone, and wall murals, from Upper Paleolithic cave paintings to the beautifully painted halls of the Maya, often depict war scenes, shields, and the like. Some pottery traditions, such as Moche ceramics from the north coast of Peru, show battle battles, trophy heads, sacrificed prisoners of war, and men decked out with shields, weapons, body armor, and helmets. On the stone facades of public buildings in Peru and Mexico are engraved bas-relief images representing dead, beheaded, and dismembered men. Such public images certainly suggest that the war was important. One of the important uses of art was considered to be to show how successful a society had been in war.

In archeology there is little evidence of battles that took place far from the places of residence. The remains of these events are so sparse and so diffuse—some abandoned weapons and the like—that they are rarely well enough preserved for archaeologists to recognize them. Most of what we know about such battles comes from historical and ethnographic records, so this aspect of prehistoric warfare is now lost, but it certainly did exist.

Moving back in the human timeline to the “historical” period, we find a wider variety of information about the conflicts than we can extract from mere archaeology. Early historical records, sometimes written by native people who learned the language of the invading culture, are helpful as they constitute information collected by early explorers.

¹⁶ For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

¹⁷ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

Accounts by anthropologists, missionaries, or government agents who learned the local language and wrote diaries or lengthy reports contribute to the record. These latter sources may also include the written accounts of traditions, legends, epic stories, etc. transmitted orally. The Bible, the *Mahabharata* of India, the Scandinavian sagas and the *Iliad* of Homer were all transmitted orally and only later captured in written form. They all include war as one of their important themes. A traditional story of the Hopi gives an idea of such events and at the same time reveals details and aspects of some types of warfare, from the use of fire to the timing of attacks.

Just as the sky began to turn yellow at dawn, Ta'palo rose to his feet on the roof of the kiva¹⁸. He fluttered his blanket in the air, and then the attackers scrambled to the top of the mesa and began their assault. There were many of them, so many that they filled the village of Awat'ovi... Running from kiva to kiva, they discovered that the men were inside. The stairs were immediately removed, thus depriving those inside of any chance of escape. Then they all came to Awat'ovi with finely crumbled juniper bark and firewood. After removing the stairs, they lit the bark. they lit the juniper bark and firewood, and threw them into the kivas. They then set fire to the piles of firewood on the roof of the kivas and threw them out the hatches. Then they shot their arrows at the men below... then the attackers broke into all the houses. As soon as they came across a man, it didn't matter if he was young or old, they killed him. Some were simply grabbed and thrown into a kiva. Not a single man or boy was overlooked.

Bunches of dried chillies hung on the walls. the attackers pulverized them. and they scattered the powder inside the kivas, just above the flames. So they closed all the hatches to the kivas. As a result, the smoke could not escape. The chilli powder caught fire and, mixed with the smoke, stung unbearably. There were cries, screams and coughs. After a while the ceiling beams caught fire. As they burned they began to give way, one after another. Finally, the screaming stopped and everything was calm. In the end, the roofs collapsed on the dead, burying them. There was only silence.¹⁹

In addition to oral traditions, ethnographic accounts and other more recent records exist around the world about the nature and intensity of traditional warfare. The tremendous impact that Western society and other complex societies, such as China, had on studied peoples already before the arrival of anthropologists or other chroniclers makes their records problematic. Although many ethnographers attempt to describe the "traditional" society they set out to observe, their work actually recounts how the elderly in society lived when they were young. Such research does not accurately describe the "pre-impact" situation, which had often ceased to exist several centuries ago. For example, the Germans had pacified the Samoan archipelago nearly a hundred years before the young Margaret Mead arrived there for her famous study in the

¹⁸ A "kiva" was a circular underground construction, accessed by a ladder through an opening in the roof. It was typical of the Hopi, Anasazi, and Pueblo Indians in general. *N. from trans.*

¹⁹ Examples:

mid-1920s. Although there had once been much warfare, all was peaceful when Mead arrived, which is reflected in his rather idyllic portrayal of life on the islands. Earlier accounts present a very different picture. The Samoans had fought each other and neighboring island groups for a long time. Missionary John Williams, between 1830 and 1832, reports that one village had kept a record of 197 battles. One day he inquired about the flames and smoke engulfing the mountains in the distance and was informed "that a battle had been fought that very morning and that the flames we saw were consuming the houses, the plantations and the bodies of the women." and of children and sick people" who had fallen into the hands of the conquerors. Samoa was at peace in the 1920s but at war in the 1920s.

The various types of war tactics that social groups have used over time are yet another aspect of conflict. Surprise attacks are the most common form of warfare in non-complex societies. The objective of a surprise attack is to damage the enemy, without the intention of exterminating him or conquering his territory. Dealing damage to the enemy while taking as little risk as possible is the *modus operandi* in surprise attacks. The dawn attack, in which the attackers have the light advantage but the victims are still asleep or unaware, is classic universal behavior. Ernest Burch collected numerous accounts of war stories that the elderly Eskimos of northwestern Alaska had heard as young men: "The most common method of achieving the tactical objective of [annihilation] was surprise attack. This was carried out by approaching a settlement by crawling under the cover of darkness. The ideal situation was for the approach to be made while everyone in the settlement was in the social center [an especially large house]. if the attackers had arrived too late, when everyone had gone home [from the community center]. the [attackers] would have had to try to eliminate the inhabitants of the village one by one, going from house to house and killing them in their sleep."²⁰

Even modern nation-states carry out surprise attacks. Winston Churchill was enamored with the concept of surprise attack, and the World War II commandos were created to carry it out. Ambushes are actually a special kind of sudden attack where the goal is to surprise one or two individuals, kill them, and then run away.

Pitched battles, in which large groups of combatants stand and line up facing each other, are less common, but have been fought by all kinds of societies. Since many battles are more dangerous to attackers than raids, they occur less frequently. Ranging in size from fifty men on each side to the massive battles of the Somme in World War

²⁰ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

I, pitched battles are what most people today think of as war. Such encounters can sometimes end in a rout, as the defeated flee and lose cohesion. Under such circumstances large armies are annihilated or entire communities are massacred. Alexander the Great's goal in battle was always to hit a part of the enemy line so hard that it broke and the soldiers scattered, then his army massacred them as they fled. Some massacres of the past affected only fifty or a hundred individuals, but if in them the whole social group was annihilated, the event was more devastating than the defeat of a great army.

Another aspect of war involves the degree to which the conflict is linked to another type of interaction between the opponents. Many societies trade or even exchange spouses with other groups for part of the year and attack them for the rest of the year. Planning a massacre treacherously disguised as a feast or celebration is an example of such shifting behaviors and is a recurring theme around the world. An ethnographic account told to the anthropologist Napoleon Chagnon in the 1960s by Kaobawa, a leader of a small Yanomamo village, reveals how this could happen. The Kaobawa group, with few allies and under pressure from their enemies, tried to strike up an alliance with a neighboring group. This village was actually part of the enemy alliance and took advantage of Kaobawa's desperation by inviting his group to a supposed party. When they arrived at the host village, "the men of the Kaobawa group danced separately and as a group and were invited into the homes of their hosts. Then their hosts came down on them with axes and clubs, killing around a dozen visitors before they could break through the palisade and escape."²¹

The Germans and Russians were actively trading useful war materials right up until the day before the Nazis attacked in World War II. In the highlands of New Guinea, surprise attacks often had to be planned in secret, leaving out men and women with close relatives in the groups to be attacked, as otherwise it was to be expected. to warn future victims. All types of society, from hunter-gatherers to states, exhibit these dual friendship-enmity relationships.

Evidence and features of past war come together, again, in Tikopia, that particularly apt example of a South Pacific "paradise." Despite efforts to control the population, including infanticide and periodic "scouting" for resettlement, the Tikopians could neither control their numbers, nor was the abundance of land and sea unlimited. In such a small society, with a total population on the island of five hundred people, one would not expect serious pressure on resources to result in war. If ever there was a place where people might have preferred to starve when all other courses of action were exhausted, it would be a small island in the middle of nowhere. However, there was war in paradise. At one point, Tikopia had three political entities. In the mid-18th century, the group living in the least productive area of the island virtually exterminated the

²¹ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

other two polities or forced them to flee. We know from historical records that at least one other major war event had taken place a couple of centuries earlier. When Tikopia did not have a single political government, a violent and devastating war broke out at least every few centuries.²²

Once I discovered that evidence of past warfare can be found anywhere in the world where reasonably good archaeological research has been done—and that the historical and ethnographic records indicate the same—it became clear that the idea of a peaceful past it was a myth. With this in mind, I went back to my two decades of research in the Southwest and wondered why there had been so much war. The common thread running through all of these wars that I discovered, including the ones in the Southwest, was that there was a correlation to people exceeding the carrying capacity of their area. I believe that ecological imbalance is the root cause of war. But it is one thing to believe this and another to demonstrate said relationship. To achieve this, it is necessary to be able to show that said imbalance existed. Furthermore, it is necessary to be able to offer an idea of how the pressure on resources would cause a chronic and continuous war rather than other effects.

Obtaining archaeological evidence of carrying capacity pressure requires luck and intelligence, so it is rare. Evidence of climate change, which affects carrying capacity, is easier to find. In a place like the Southwest, where agriculture is, and probably always has been, marginal, climate deterioration should coincide with periods of food shortages. The archeology of the region as a whole shows that when the climate was mild, the population grew and there was not much war. When the weather deteriorated, the war intensified, as can be seen in El Morro, where I found evidence of warfare and rapid construction of fortified towns. The war seemed to change according to the times were good or bad. Although my team struggled to determine the degree of pressure on carrying capacity at the time when people lived high in the hills of the Mimbres Valley, when we place these settlements within a regional context, everything took a turn for the worse. The war in the region was real and followed a pattern. If the people of the old Southwest responded to changes in the weather with more or less war, the war was the result of some external event and not caused by anything intrinsic.

It is possible to describe a model of how human reproductive potential combined with carrying capacity limits results in ecological imbalance and war. If humans had no mechanisms to prevent overexploitation of their resources in the long term and could not keep their populations below carrying capacity enough to avoid being subjected to regular food shortages, starvation must have been a constant threat in the past. Once the notion of inherent conservationism is recognized as a myth, it becomes clear that humans would have suffered from food shortages on a regular basis. In fact, regardless

²² By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

of the type of human organization, this scarcity occurred in the past, archeology and history show.

Before starving, humans perceive that they are falling below what they consider to be their minimum standard of living. As I learned in Samoa, a food crisis can take several months to develop after a natural disaster, and the impending crisis can be anticipated. People recognize what is happening long before it seriously affects them, and they react if they can. For most animals, natural disasters, disease, and famine are the population limiters. Although human numbers are affected by disease and natural disasters (and there was little we could do about them in the past), hunger is a different matter. Hunger is different because humans, with their brains and social structures, can do something about running out of food. Humans starve only when there are no other options. One such option is to try to take from others either the food or the lands that produce the food. People perceive resource scarcity *before* they are starving. If there is no state or central authority to stop them, they will fight before the situation becomes hopeless. It is resource scarcity in the form of famine, not starvation, that precipitates war. If resource scarcity is the normal human condition, then war has been a part of life most of the time in most places.

When the number of humans grows, starvation and disease can possibly contain the population. This is a potential scenario, but it doesn't appear to have ever happened in the past. It is hard to imagine an entire society letting starvation control the size of its population. Even the most passive pacifist will admit that people will fight rather than starve—especially if the threat of starvation is a chronic, recurring event. Even natural disasters that can result in food shortages can cause a reaction. Most likely, most catastrophes have instigated wars and not caused groups to wait and see who starves first. Starvation, or even the threat of it, rarely runs its course without sparking conflict.

This does not mean that war is inevitable. Humans could choose to starve, or leaders could choose to starve parts of the population. Starving peasants in the most complex societies, whether in China, Ireland, Japan, or the Yucatan, would probably have struggled for food before starving to death, but the central government would not normally allow them to do so. On some occasions, there may not be anyone around to get resources from. A band of Eskimos that ran out of food would not have had the option of taking it away from anyone else if they had no close neighbors. Most people had other societies close enough that fighting and taking resources from them was always a possibility. When resources are critically scarce, fighting over them has been an option for humans for over a million years.

If warfare was common in the past, as I suspect, then the biological consequences would be considerable. From the point of view of each society, war is a means of obtaining the resources that are most urgently needed. From a broader perspective, war can be a factor in population control. The effects of war are both direct and indirect. Raids, battles and massacres do occur and result in considerable numbers of deaths, especially of young males in stateless societies. (Children are also often killed,

but women are often taken captive rather than killed.) The murder of young males does not directly control much of the population if the surviving males can take multiple wives. Archaeologists have found that in many situations a small but considerable percentage of women of reproductive age are killed. This would have a considerable impact on the growth rate of the society. Furthermore, men produce the food. If a group loses a significant number of men, the rest of the society may starve as a result. However, most of the effects of conflict on population growth are much more indirect.

Fig. 4. *The use of armor was not restricted to peoples who used metal. The Eskimos live in the most inhospitable environment on earth, and it might seem like there was no reason to go to war, yet attacks and ambushes were so common that they wore bone armor (left) under their parkas. And the inhabitants of the New Guinea Highlands fashioned armor from fiber that could stop arrows (right), belying the idea that their warfare was not serious and deadly.*

We know from skeletal analysis that, for example, in the American Southwest as war escalated in the 13th century, general health declined, particularly among children. At this time, people settled in large defensive towns, raising the possibility that if the crops were bad, they would be bad for everyone. There were few means of sharing between communities. The population in the Southwest declined precipitously during this time period, but probably more because of disease and starvation than because of the war itself. Similarly, in the New Guinea highlands, when a contending group is defeated, the survivors flee. Before settling down and being assimilated into another group, they are subjected to the elements, malnutrition and even starvation. Such defeats affect child and female mortality rates, although to what degree they actually do have rarely been measured. Conflict should not be seen in itself as a means of population control but as part of a general process. The mere fact that the population is reduced by disease and starvation does not mean that war is not a key component of the process and can easily be separated from it. War, along with starvation and disease, becomes a component of population control—although it is futile to try to isolate its direct effect.

Despite the tendency to think of societies as existing in isolation, people never live in isolation. There has never been a time when large tracts of usable land lay empty around every society.²³ Almost no group throughout history had a carrying capacity that remained fixed in space—everyone had neighbors, and the resources of those neighbors were always a new potential source of resources. It was possible, and it certainly did happen, that a group, or members of that group, could peacefully obtain

²³ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*], we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

resources from neighboring groups in time of need. Those same neighbors saw the situation in reverse. They viewed the resources of the first group as potentially usable if they could seize them. All social groups have neighbors around them, and those neighbors have the same potential provisioning problems as well as desirable resources. You can try to cooperate with your neighbors to get food or land from them when you need it, or you can compete with them and try to take food or land from them when you need it. Most people did both at the same time; they cooperated and competed with their neighbors, depending on the circumstances.

What sets us humans apart from almost all other animals is our ability to take resources away from other groups, through group action. A large male bear can drive other bears out of the best fishing spots along a river, and a male lion can defend his precious territory from other lions, but humans take this process much further. By *cooperating* they can seize another group's territory or resources—either by killing its members or driving them away from resources. Such group aggression is not without risk, but it is affordable. The ability to carry out social cooperation establishes a dynamic relationship between population growth, carrying capacity, and the potential for conflict.

Human societies are not only never alone, but no matter how well they control their own population or how ecologically they act, they cannot control the behavior of their neighbors. Each society must face the real possibility that its neighbors do not live in ecological balance but rather grow in number and try to take resources away from the groups around them. Societies have not only always lived in a changing environment but have always had neighbors. The best way to survive in such circumstances is not to live in ecological balance with slow growth, but to grow fast and be able to repel competitors while taking other people's resources.

To see how this typically human dynamic works, imagine an extremely simple world with only two societies and no unoccupied land. Under normal conditions, neither group would have a strong motivation to take away resources from the other. People might be a bit hungry, but not hungry enough to risk dying trying to eat a little better. A few members of each group might die indirectly from food shortages—due to illness or infant mortality, for example—but seen from an individual perspective, they are much more likely to die trying to steal food from neighbors than from of the usual shortages in supply. Such a stable world would never last long. Populations would grow and human activity would degrade land and resources, reducing their abundance. Even if, by chance, everything stayed the same, it must be remembered that the climate is never constant: times of food scarcity would occur due to changes in the weather, especially over periods spanning several generations. When a bad year or a series of bad years occurs, the willingness to risk fighting increases because the probability of starvation increases.

If one of the groups is facing starvation and is much larger, better organized, or has better fighters among its members, the motivation to take territory from its neighbors is high, since it is very likely to succeed. Since human groups are never identical, there

will always be some group for which war as a solution is a reasonable option in any food crisis, since it will have a good chance of succeeding in taking its neighbors' resources through war.

Now comes the most important part of this simplified story: the group with the largest population will *always* have the advantage in any situation of competition for resources, whatever those resources may be. Throughout human history one of the contending parties rarely has better weapons or tactics for long, and most wars between small-scale societies are wars of attrition. With the same skills and weapons, each side would be expected to kill the same number of opponents. Over time, the larger group would eventually overwhelm the smaller one. This size advantage is widely recognized by humans throughout the world, and they go to great lengths in order to maintain numbers comparable to their potential enemies. This is seen anthropologically in the universal desire to have many allies, and in the tactic, common to smaller groups, of inviting other societies to join them, even in times of food scarcity.

Assume for a moment that, by some miracle, one of our two groups is full of far-sighted green geniuses. They are able to keep their population in check and, what's more, to keep it below carrying capacity enough that small changes in weather, or even longer-term changes in climate, do not cause a food shortage. If they only need to consume half of what's available each year, even when it's a terrible year, this group will likely weather adversity with ease. What's more, given a few good years, these masterfully green folk *won't* grow rapidly, as doing so will mean they'll be in trouble when the good times are over. Consider them the ecological equivalent of industrious ants.

The second group, meanwhile, is just the opposite—it's made up of ecological jerks. They don't have wonderful processes to control their population. They are always at the limit of carrying capacity, reproduce rampantly and frequently suffer from food shortages and their inevitable consequences. Consider this flock the ecological equivalent of happy-go-lucky cicadas. When there are good years, they have more children and increase their population rapidly. Within twenty years, they have doubled in number, and with the first slight weather change, they have quickly run out of food. Of course, if this had been a group of "noble savages" giving up the war, they would have starved and only a much smaller and more sustainable group would survive. But this is not a group of noble savages; these are ecological jerks and attack their good neighbors to save their own skins. With their numbers now twice that of their good neighbors, the cretins eventually prevail after heavy attrition on both sides. The "good" ants end up as dead ants and the "infamous" cicadas inherit the earth.

The moral of this fable is that any group that achieves ecological balance and stabilizes its population even in the face of environmental changes will be at a tremendous disadvantage to societies that do not behave in this way. The successful society in the long run, in a world with many different societies, will be one that grows when it can and fights when it runs out of resources. It is useless to live an ecologically sustainable existence in the "Garden of Eden" unless the neighbors do the same. A single non-

conservation society in an entire region can start a process of conflict and expansion of the “cicadas” at the expense of the idyllic “ants”.

This smacks of Darwinian competition—survival of the fittest—between societies. Note that “the fittest” in the case of our two groups was not the greenest, it was the fastest growing. The idea of such Darwinian competition is difficult for many to digest, especially when it gives the impression that the “bad guys” are the winners.

In the real world, the results of such a scenario might not be as dramatic. A population wouldn’t get that big before the competition started and most likely everyone would stop fighting before one party was completely wiped out. For other animals, more stable populations should trump less stable ones.

In an extreme case, let us assume that humans were not capable of war and were more like rabbits or deer. If one of the two social groups, let’s call it the “balanced” population, developed a series of mechanisms to avoid overexploitation of the environment and to control its population, and the neighboring group did not develop them, it is expected that the unbalanced neighboring group would grow rapidly, depleted their environment, and as a result the population periodically sank. Let’s call this group the “bumpy” population. When the population sank, the population would be reduced so much that the surrounding areas would be empty. The balanced group, on the other hand, would not suffer such sharp declines in population. Every time the ups and downs town suffered a drop in population, the balanced town would take over a small portion of the unpopulated territory, as this town would grow when it could safely do so. Over time, the checkered people would eventually be replaced and eliminated, though not through war.

That’s how things might work in the animal world—but humans aren’t rabbits or deer. Since humans can fight, the opposite is true. When the town with ups and downs grows sharply, they can expand at the expense of their balanced neighbors. Perhaps there will be only a small expansion at a time. When its growth begins to turn into a slump, it will fight hard for new territory rather than starve. Once his numbers have been reduced and conditions have improved, he will stop fighting. The balanced people do not have the opportunity to move into the empty territory of their more aggressive neighbors. Rather, the people with ups and downs take over part of the territory of their balanced neighbors - who, as a result of the conflict, will have reduced their numbers. After repeated cycles of this process, the up-and-down people can be expected to replace and eliminate the balanced people. And this is exactly what scholars have found in the highlands of New Guinea, in tropical South America, and in even more complex societies.

So after considering all the evidence presented in my own work and that of other anthropologists, we see that life in the past was not what we thought it was—or what we wanted it to be. There are two myths about human history that have not only prevailed, but are interrelated. The myth of the “noble savage” who lived in peaceful harmony with nature is a naive version of the idea that traditional societies have been able to live below carrying capacity and were able to control their populations in

ways that they did not exceed the supply of resources. But human societies have not been able to do such a thing. And, along with this misconception, there is the myth of a peaceful past, which sees war as something occasional, of little importance and almost like a game. War in the past was frequent, serious and deadly. If human beings have been unable to live in ecological balance throughout history then, because they are intelligent and lack predators to control their population, they will compete for resources. There could be no peaceful past if there was no ecological balance. Both myths are related, and neither is true because both are linked. The human inability to live in stable equilibrium with respect to resources almost guarantees war. The nature of war and the way humans cope with carrying capacity exceedances vary by type of society. These differences provide a new perspective on the end of the historical trend in which we find ourselves as well as on what we can expect in the future.

Notes²⁴

1. Over the years other archaeologists were also seeing these settlements as defensive; see LeBlanc, *Prehistoric Warfare in the American Southwest*, University of Utah Press, Salt Lake City, 1999.

2. In societies where social groups are fluid and people are related to people from many other groups, it is difficult to determine where one group ends and the next begins. Determining what was an intragroup homicide and what was an intergroup act is not easy, so I have deliberately overlooked a great deal of evidence of intragroup violence, if only to be conservative.

3. Kidder and Guernsey, *Archaeological Explorations in Northeastern Arizona*, US Government Printing Office, Washington, 1919.

4. Hurst and Turner, "Rediscovering the „Great Discovery’: Wetherill’s First Cave 7 and its Record of Basketmaker Violence,” in *Anasazi Basketmaker, Papers from the 1990 Wetherill-Grand Gulch Symposium*, edited by Victoria Atkins, Utah Bureau of Land Management Cultural Resource Series, no. 24, Salt Lake City, 1993, pages 143-191; Cole, "Basketmaker Rock Art at the Green Mask Site, Southern Utah,” in *ibid.*, pp. 193-222; summarized in LeBlanc, *Prehistoric Warfare in the American Southwest*.

5. Brown and Tuzin (eds.), *The Ethnography of Cannibalism*, Society for Psychological Anthropology, Washington, 1983.

6. Arsuaga, "The First Europeans: Spanish Caves Paint a New Picture of Evolution on the Continent,” in *Discovering Archeology*, 2, 5, 2000, pages 48-65; Askenasy, *Cannibalism: From Sacrifice to Survival*, Prometheus Books, Amherst, 1994; Brown and Tuzin, *The Ethnography of Cannibalism*; Dornstreich and Morren, "Does New Guinean Cannibalism Have Nutritional Value?” in *Human*

²⁴ The bibliographical references cited in most of the following notes do not correspond exactly to the originals, but have been completed by adding technical data that was missing in the original. *N. of the trad.*

Ecology, vol. 2, No. 1, January, 1974; Fernández-Jalvo *et al.*, “Human Cannibalism in the Early Pleistocene of Europe”, in *Journal of Human Evolution*, 37, pages 591-622, 1999; Heidenreich, “Huron” in *Handbook of the North American Indian*, ed. Bruce Trigger, vol. 15, Northeastern Indians, Smithsonian Institution, 1978; Tannahill, *Flesh and Blood: A History of the Cannibal Complex*, Stein and Day, 1975.

7. Marcus and Flannery, *Zapotec Civilization: How Urban Society Evolved in Mexico's Oaxaca Valley*, Thames & Hudson, New York, 1996²⁵²⁶; Anderson, *The Savannah River Chiefdoms: Political Change in the Late Prehistoric Southeast*, University of Alabama Press, Knoxville, 1994; DePratter, *Late Prehistoric and Early Historic Chiefdoms in the Southeastern United States*, University of Georgia, Laboratory of Archeology Series, Report No. 72, 1983; Kemp, *Ancient Egypt: Anatomy of a Civilization*, Psychology Press, 1991[1X]; Wenke, “Egypt: Origins of Complex Societies,” in *Annual Review of Anthropology* 18, 1989, pages 129-155.

8. See Marcus and Flannery, *Zapotec Civilization: How Urban Society Evolved in Mexico's Oaxaca Valley*.

9. Kirkbride, “Umm Dabaghiyah”, in *Iraq*, no. 34, 1972, pages 3-15; *ibid.*, no. 35, 1973, pages 1-7 and 205-209; *ibid.*, no. 36, 1974, pages 85-92; *ibid.*, no. 37, 1975, pages 3-10.

10. Catlin, *Letters and Notes on the Manners, Customs, and Conditions of the North American Indians*, Dover Publications, Inc, New York, 1973.

11. Unburied bodies have been found throughout the world, as well as formal burial sites that contained far fewer men of fighting age than women, evidently leading us to presume that the missing men died in combat and were buried where they fell rather than in their own community.

12. Sugiyama, “Burials Dedicated to the Old Temple of Quetzalcoatl at Teotihuacan, Mexico,” in *American Antiquity*, 54 (I), 1989, pp. 85-106; and “Worldview Materialized in Teotihuacan Mexico”, in *Latin American Antiquity*, 4 (2), 1993, pages 103-129 .

13. Malotki (ed.), *Hopi Ruin Legends*, University of Nebraska, Lincoln, Nebraska, 1993.

14. Burch, “Eskimo Warfare in Northwest Alaska,” in *Anthropological Papers of the University of Alaska*, 16 (2), pages 1-14.

15. Chagnon, “Yanomamo Social Organization and Warfare”, in *Natural History*, LXXVI, 1967, pages 44-48.

16. Kirch, *The Evolution of Polynesian Chiefdoms*, Cambridge University Press, Cambridge, 1989.

17. The obvious exception is when new lands are first settled, but this is a one-time event and is irrelevant.

²⁵ There is an edition in Spanish: *The Zapotec civilization: how urban society evolved in the Valley of Oaxaca*, Fondo de Cultura Económica, México, 2001. *N. from trans.*

²⁶ There is a Spanish translation: *Ancient Egypt: anatomy of a civilization*, Grijalbo Mondadori, Barcelona, 1996. *N. of the trad.*

ROMANTIC PRIMITIVISTS.¹

By Harold Barclay.

To the editor of *Anarchy*:

I would like to comment something about the debate about anthropology, primitivism, etc.

First, if there is romanticism in it, I doubt it comes from anthropologists. Rather it comes from those primitivists who have donned special romantic glasses to read ethnographies. Having read countless ethnographies, I have seen that they contain multitudes of vicious attacks, murders and riots, that the data shows that the sexes were not considered totally equal, that matrilineal societies are still ruled by men (even if not the fathers but mothers' siblings), that hunter-gatherers are not as passionate nature conservationists, that hunter-gatherers have practiced slavery (Northwest Coast [of North America]), etc.

Another point that needs to be stressed is that the hunter gatherers of the present - the few that survive - are by no means identical to the hunter gatherers of a thousand or ten thousand years ago. Anthropologists can only rely on these contemporary examples and limited archaeological data (which is like reading a book with three-quarters of the pages torn out). Hunter-gatherer societies, like all societies, have changed over time and it is remarkable that today they only inhabit those regions of the world where no one else wants to live. They live in remote areas, not very benign, which serve them as a refuge while ten thousand years ago they had practically all the land to themselves. Modern hunters have been heavily influenced by the outside world. For example, Canadian Indians and Siberian Indians have been hunting for fur for the elite international market for 300 and 400 years respectively. All kinds of modern technology have been available to these people for a long time. The Inuit [Eskimos] are very happy with their powerful rifles, motor boats, etc.

In my book, *People without Government: An Anthropology of Anarchy*, I tried to present more or less anarchic societies, flaws included. Although I made a statement that 10,000 years ago all humans were anarchists, my words must be understood within the context of what I was referring to when I spoke of anarchy in that research, namely the absence of a state and government. I did not mean to suggest that such societies were any kind of utopian social order. Not much less. I suppose that almost no anarchist

¹ Original text that appeared in *Anarchy: A Journal of Desire Armed*, Spring/Summer 2000, under the title "Romanticizing primitivists". Translate Last Redoubt. *N. from t.*

would want to live in those societies, if only because their freedom would be very limited despite the absence of government.

In that book I pointed out that no society can exist without having some form of sanctioning apparatus and that they all have drawbacks. Legal sanctions entail state oppression. Diffuse sanctions entail ostracism, gossip, surveillance. Religious sanctions may involve oppressive power on the part of shamans (as in the case of the Inuit) or, for example, the power to mark with a hue among Aboriginal Australians.

Most anarchists say they do not accept "leaders" despite the fact that the history of anarchism is full of them. All hunter-gatherer, horticultural, and pastoral societies also have their leaders. They can be the Elders (Australians), the Great Hunters (den[#bookmark3][e³, Inuit, etc.), the Great Men (Melanesians, Berbers, etc.), the Seers (lugbar[#bookmark4][a⁴,] dink[#bookmark5][a⁵, etc). Although they are leaders, they do not necessarily have to be tyrants. Most are not imposed by force and violence; they are influential men.

Hunter-gatherer societies and many horticultural societies have been called egalitarian, but this is misleading. Although women may have great equality, the balance is still tilted in favor of men and preference is given to the elderly, religious specialists and technicians.

True warfare is not a feature of hunter-gatherer societies, but attack, enmity, and murder are. The Dene carried out raids on neighboring gangs to steal women, among other things.

A commenter said in *Anarchy* that pastoral societies possibly exemplified forms of organization without a state or government. But such cases are limited to certain parts of sub-Saharan Africa, such as the new[#bookmark6][r⁶, or perhaps a few reindeer herders in northern Eurasia. The vast majority of pastoral societies have state or quasi-state structures. Turkish, Afghan and Iranian herdsmen have a tribal model in which a lineage is the noble lineage from which the khan emerges who will rule with impunity. After all, we have all heard of Genghis Khan and Tamerlane. Berber and Arab herdsmen have a more ambiguous social structure, but easily fall into tyranny. The kingdom of Saudi Arabia grew out of the tribal dynamics of Central Arabia, just as the Durrani dynasty of the Afghan kingdom grew out of the interaction of the Pukhtu tribes[#bookmark7][n⁷ in the 18th century.

² The author refers to an aboriginal belief consisting, in short, that if an individual was ritually marked with a magic bone, he would die. Many aborigines believed in it so much that they actually died if the bone was pointed at them. *N. from t.*

³ The Dene are a group of Atapaskan Indians from northern Canada. *N. from t.*

⁴ The Lugbara are a farming people (farmers and herders) in Africa. *N. from t.*

⁵ The Dinka are a farming people of Africa. *N. from t.*

⁶ The Nuer are a pastoral people of East Africa. *N. from t.*

⁷ The Pukhtun, Pashtun or Pathans, are an ethnolinguistic group from Afghanistan and Pakistan. *N. from t.*

In the 14th century, Ibn Khaldun developed the first systematic theory of socio-cultural dynamics in which he argued for the existence of a cyclical process between pastoral and tribal peoples on the one hand and the civilized urban state on the other. The tribe functioned according to "asabiyya" or social solidarity based on kinship. She was healthy and vigorous.

The city was dominated by the state, was rich and tended to degenerate and become corrupt. The members of the tribes were attracted by the gold of the city and saw its weakness and degeneration. So they invaded the city, took control of the urban civilization and reinvigorated it with a new government. However, they too were doomed to degenerate and be overtaken later by a new wave of healthy tribal men. The cycles continued, and indeed this process seems to be a reasonable description of life in Islamic North Africa, at least in the time of Ibn Khaldun.

Some horticultural societies, as well as a limited number of pastoral societies, had anarchic politics but, as I have already tried to suggest here, this also caused serious problems in terms of equality, violence and other problems that often concern farmers. anarchists. Therefore, my opinion is that anarchy, defined simply as the absence of state and government, has been very widespread in human history, but that society is by no means the utopia or the model that the primitivists present us with.

Of course, the primitivists are right to identify the city and agriculture with the state and government. Although there may possibly be some viable alternatives to government and the state, there are no viable alternatives to agriculture in a world inhabited by six billion people. However, some important reforms in agriculture are feasible and necessary. We can question a number of current practices such as the increasing reliance on a few varieties of plants and animals, monoculture, traditional irrigation methods, reliance on pesticides, herbicides and artificial fertilizers, tillage techniques, of raising calves, pigs and chickens, the fattening system of animals[[#bookmark8](#)], the administration of antibiotics to livestock, the amount of non-renewable energy sources used to produce crops... in a world that is transforming agriculture into agribusiness. It has been shown that the most effective farmers in the United States are the Old Order Amish, who farm approximately 50 acre farms[[#bookmark9](#)][s[1285]with horses and mules. Traditional horticultural societies and ancient peasant societies can also teach us many things.

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Presentation of “AN ECOLOGICAL WAY OF SEEING THE INDIANS”

The value of the text that we present below lies in the fact that it is an example of a materialist and scientific interpretation of the relationships between human groups and their environment. The author shows with data and examples the falsity of the image of the “ecologist Indian” and how what really determined and limited the ecology of primitive peoples were the physical conditions (types of ecosystems and available species, climatology, level of technological development, demographics, human biology, etc.) and not cultural beliefs and values. The latter were rather a product of material conditions, not their cause.

Unfortunately, despite his predominantly materialistic and scientific approach, the author falls into the idealistic naivety of harboring the hope that ecological ethics will play a major role in the current and future conservation of Nature. The question that arises then is, if ethics played a secondary or even negligible role with respect to material factors in determining and restricting the relations between primitive human beings and their environment, why would the situation have changed? to be different today or in the future? Why should material factors, such as the level of technology available or the human population, give way to non-material ethics and culture? On what is this hope based? If the conservationist ethic did not serve primitive humans to preserve Nature (assuming that they really showed such an ethic), why should it serve us today? The world is still predominantly physical and human beings, deep down and at least for now, are still human. If anything can save what remains of Wilderness it is not going to be exclusively or primarily a conservation ethic (laudable as that may be), but rather a profound and radical change in physical factors that both past and present and in the future they are the ones that have always determined and will continue to determine the relationship between human societies and their environment.

AN ECOLOGICAL WAY TO SEE THE INDIANS

By George Wuerthner¹

¹ Translation by Último Reducto of “An ecological view of the Indian”. Original published in *EF!Journal* n° 7, pages. 20-23, August 1, 1987. *N. from t.*

Most ecologists tacitly assume that early people lived in ecological harmony with their environment and had little impact on their habitat. Implicit in this assumption is the idea that the ravages caused by Western civilization are the result of the abandonment of the primitive earthly paradise and that European cultural roots are to blame for the current environmental tragedy. Records of the abundance of wildlife found by early European explorers and later by American-born trappers, traders, and settlers are often used as evidence that primitive peoples, through their superior ecological wisdom, were inherently best administrators in the Americas. They were?

On an intertidal mud flat at the mouth of the Noatak River in western Alaska, I once found the tooth of a woolly mammoth². It was about the size of a large melon and had a flat, rough surface like a file and pointed bumps that were the roots. Perhaps 10,000 years or more before my visit, this mammoth had roamed the Alaskan tundra. Whatever happened to it, and to dozens of other giant Ice Age mammals, has baffled scientists for years, and the matter is still unresolved. In addition to the woolly mammoth, other large animals - including giant sloths³, mastodons⁴ and their predators such as dire wolves⁵ and short-faced bears⁶- disappeared in a short geological time interval of a few thousand years. Interestingly, as far as is known, there were no corresponding extinctions of small mammals - the only species to disappear were mammals over 100 pounds⁷. Why?

Some people have proposed that climatic changes caused stress to these large mammals, to the point of causing their extinction; But wouldn't climate change have also affected smaller animals? There are various schools of thought on the subject, including proponents of the Excessive Killing hypothesis⁸ who posit that the Paleoindians hunted these animals to extinction. Could it be like this? What are the implications for our own mythology about the natural balances that existed between the Indians or the Eskimos at the time Europeans ventured onto the continent? To answer these questions, we can apply ecological principles to human beings and try to piece together a possible explanation for the relationships between technologically primitive peoples and their environments. I will examine here the cultures of the North American Indians and Eskimos, but the same principles would apply to any low-tech people, including the ancestors of Europeans or any other geographic or racial group. What follows is speculation and it would be difficult to prove whether the suggestions presented are right or wrong. I admit that the possibility of making mistakes in interpretation is great; however, I believe that the process of seeing peoples within an ecological con-

² *Mammuthus primigenius*. *N. from t.*

³ Genus *Megatherium*. *N. from t.*

⁴ Extinct proboscideans of the family *Mammutidae*. *N. from t.*

⁵ "Dire wolf" in the original. *Canis dirus*. Extinct species similar to the current wolf, although larger.

⁶ "Short-faced bear" in the original. Extinct bears belonging to the genus *Artodus*. *N. from t.*

⁷ 1 pound equals 453.5 grams. *N. from t.*

⁸ "Overkill hypotheses" in the original. *N. from t.*

text can bring new insights that could dramatically change the way we see ourselves - technological humans - and our relationship with the Earth.

Long before the Pleistocene extinctions, something happened that made humans different from other animals: We substituted cultural flexibility and technological innovation for biological evolution. Biological change is slow and conservative; tends to preserve the status quo. This is one of the reasons why human beings tend to be essentially the same in terms of mental aptitude, behavior, and ability to interact. Despite slight differences in physical appearance and other secondary traits, our basic genetic makeup is essentially the same regardless of race - hence our country's premise⁹ that all people are created equal. However, culture is much more flexible, and the incredible ethnic diversity that developed in human groups before modern advances in communication was a product of this ability of culture to evolve rapidly. Similarly, while biological changes are not easily transferred through a population since they require the transmission of genetic material, cultural and technological changes are easily transferred between different groups. A European can learn to kayak and an Eskimo can learn to shoot a rifle, despite their different cultural backgrounds. Therefore, culture and technology give human beings the ability to quickly adapt to new environments and this ability is the main reason for our current dominance on Earth.

Evolution can be seen as a process of change aimed at increasing the amount of resources that each individual contributes to ensure the reproductive success of their descendants. In evolutionary terms, if you don't pass on part of your genetic code to your offspring, you are a failure (your sisters and brothers also share a part of their genetic code, so by helping them you could also help your genetic line) . Those animals that leave the most offspring that reproduce themselves are the ones that win in the lottery of evolution. Since no individual or species can have the best adaptations for all environmental conditions, each of them thrives in one regime and loses in another. Indeed, the many extinct animals , such as the mammoth, are examples of species whose particular genetic code worked well under one set of environmental constraints, but failed miserably under others.

One of the environmental pressures that mammoths had to face was predation, against which their large size was a good protection. Only a very large predator could have brought down an adult mammoth, and for much of mammoth evolutionary history there were no predators large enough to pose a serious threat to them. However, any adaptation has its energy costs and these costs act as a counterbalance to the benefits it brings.

The mammoth strategy had several costs. First, his large body required vast amounts of food. (A relative of the mammoths, the African elephant, needs between 400 and 500 pounds of fodder a day!) Second, these large food requirements meant that mammoths could never become extremely numerous or form extremely large herds lest they quickly deplete their food source. Third, as a general rule, the older an

⁹ The author is American. *N. from t.*

animal is, the longer it takes to reach sexual maturity, the fewer offspring it produces, and the longer the interval between births. This reproductive strategy is fine if most hatchlings survive and most adults live long enough to produce several young. For mammoths, these costs were probably worth it since all but the youngest mammoths were invulnerable to predators.

Predators are also subject to cost-benefit analyses. Predators normally do not kill more than they can eat since they must expend energy to obtain food and each animal tries to maximize energy input with respect to its expenditure. For a predator to feed on mammoths, it would first have to have found them - ecologists call this search time.

Second, unless the mammoth was sick or injured, a predator would be at risk of physical harm. For a predator that relied on its claws and fangs for survival, a broken leg or jaw would mean certain death. A predator does not usually kill more than it can use because the capture of the prey involves risks.

Why didn't an extremely large predator evolve to attack mammoths? There were large predators, such as the dire wolf or the saber-tooth tiger¹⁰, which certainly preyed on mammoths, especially young and injured ones, but there were no predators large enough to prey exclusively on healthy adult mammoths. Food restrictions put an upper cap on the size of predators. The older an animal is, the more food it needs. A predator adapted to hunting only mammoths would have been so large that it would have had difficulty obtaining food when mammoths became scarce or widely dispersed. As I have explained above, low numbers and dispersal may have been the norm among mammoths. Likewise, a predator large enough to regularly hunt mammoths would not have been agile enough to catch smaller prey to satisfy its food needs between hunting one mammoth and the next.

A new predator arrived in this world of mammals whose main defense was their enormous size: the paleoindians. These new predators had several advantages over many of their competitors. They hunted in groups, rather than alone, and the combined efforts of many men made the group look like one very large predator, what ecologists call a "top predator." However, this apex predator had one key advantage over others: in times when game was scarce, these hunters could break up into smaller units and subsist on smaller prey or plant foods. Also, they had weapons. Armed with spears, hunters no longer had to have direct contact with their prey, thus the risk was greatly reduced.

No one knows exactly how long humans have been living in North America. Questionable evidence from a few sites suggests an early occupation, from 35,000 to 30,000 years ago. Near the end of the Ice Age, 12,000 years ago, archaeological evidence suddenly becomes abundant. Anthropologists speculate that a massive invasion of humans from Asia must have taken place then; or that, for some unknown reason, people who were already in America, if there were any, experienced sudden population growth. Ar-

¹⁰ Common name of various extinct Pleistocene carnivores belonging to various families, whose common feature was the large upper canines. *N. from t.*

tifacts found at all 12,000-year-old sites include distinctive spearheads associated with the remains of large mammals, especially mammoths. The humans who made them are called the Clovis people, referring to the New Mexico City where they were first discovered. We don't know if the Clovis hunters were recent immigrants who traveled across the Bering Sea land bridge across North America from north to south or if they were merely an inspired group of hunters already on the continent; however, the new technology - those spearheads - increased the success of these people in hunting. Clovis points were all the rage and soon everyone wanted them. These points have been found in places as far apart as New Mexico, Alberta, and Vermont.

Was it a coincidence that at the same time many Ice Age mammals became extinct? Faced with a new and unknown predator, Ice Age mammals were extremely vulnerable - especially if they relied on their size to deter predators. The strategy of the mammoths may have been as outdated as the strategy of the muskoxen - which fend off the wolves' attacks by forming a circle, but are gunned down one by one by the humans as they stupidly stand their ground. Market Stall. Perhaps mammoths and other Ice Age megafauna would stand their ground rather than flee, a good strategy against dire wolves, but fatal against men who hunted in packs and hurled deadly spears with points that could pierce their skin. .

Most likely, Clovis man did not single-handedly wipe out large mammals. Changes in the climate and, as a result, in the vegetation and its nutritional value, which affected the reproductive success and survival of these large animals, also played a fundamental role in their disappearance. Certainly, however, the Clovis people and other early hunting cultures that followed gave the coup de grace to a fauna that was already dying.

Why did these paleo-Indians destroy mammoths and mastodons and not smaller mammals like deer¹¹ and elk¹²¹³ that also roamed those plains in the Ice Age? First, there were fewer mammoths and other large animals than elk and other deer, and their low reproductive rates and densities made them vulnerable to extinction. These same biological attributes define grizzly bears, whooping cranes¹⁴, blue whales, and other animals now near extinction. Second, early hunters most likely preferred to hunt the larger animals since they would get a greater benefit for the same investment of time if they killed a mammoth rather than a deer. Third, large animals were easier to stalk and approach than timid, fast-moving deer.

¹¹ For example: "*In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*" (*Earth's Revenge*, page 166).

¹² "Deer" in the original. Here the author is surely referring to deer of the genus *Odocoileus* and perhaps also to moose and caribou, since they are the only North American cervids apart from elk. *N. from t.*

¹³ "Elk" in the original. *Cervus canadensis*. Although "elk" literally means "elk" in English, in North America it is called elk, while the true elk or elk (*Alces alces*) is called "moose". *N. from t.*

¹⁴ "Whooping cranes" in the original. *Grus americana*. *N. from t.*

If I have extended myself with the Pleistocene extinctions, it is because the restrictions that limited the Clovis people also limited the more recent Indian cultures. Did primitive people kill more than they needed to? Did they ever waste meat? Surely they would if the opportunity arose. Many archaeological sites vividly show where herds of bison and other animals were driven off cliffs and killed. No doubt much of that meat went bad as there was no way to preserve the surplus. In the days before the introduction of the horse, primitive peoples could not haul large quantities of hides, meat, or other animal materials very far. Excess meat was discarded. It was often easier to move the entire village to the slaughter site than to bring the meat back to the village. After the introduction of the horse, in the 17th and 18th centuries, there continued to be occasional wastage of meat - perhaps even more so, since the horse made it easier to obtain meat. Francis Parkman in his book *The Oregon Trail* describes a village of Arapaho Indians he visited in Colorado. "As we approached the village, we found the ground covered with an incredible number of heaps of discarded¹⁵ buffalo meat." When food was plentiful, only select portions were eaten; while in times of famine, human beings ate their own clothes or rummaged through villages for old bones and bits of skin.

Whether or not a resource is wasted often depends on the ratio of energy expended to energy gained. Most of the Indians were nomads and could not carry much extra baggage. Consequently, even if the skins were valuable for clothing, if they already had enough clothing they probably wouldn't take extra skins with them. It was more energy efficient to get new pelts when new clothes were needed than to lug around pelts left over from previous hunts. Mobility also limited what they could accumulate as wealth and what they "needed" to survive. Thus, although they could occasionally waste resources, itinerant hunting and gathering peoples made little demands on their surroundings for the simple reason that they could not use resources on the same scale as sedentary peoples. Agriculture and the large population base it supported brought about the beginning of the end of Eden.

It is entirely "natural," not deviant human behavior, to waste abundant resources, and there are examples of "waste" in many other animals. For several weeks I watched grizzly bears eat the salmon they caught in the spawning beds of an Alaskan stream. During the first part of the migration, the bears consumed the whole fish; But as salmon became more readily available, bears became more choosy, eating only select portions of the fish, such as roe, and leaving the rest to seagulls. When the migration was over and even rotten fish were scarce, the bears once again went back to eating whatever they could find.

What we call waste depends on the definition. The excess meat not eaten by the Indians supported a community of "camp followers" scavengers that included ravens, wolves, and grizzly bears, just as the remains of wildlife carcasses support many species

¹⁵ In North America bison is called "buffalo", although this species has nothing to do with true Asian or African buffalo. *N. from t.*

today, including magpies, crows and coyotes. The same can be said of indiscriminate hunting¹⁶. I'm not excusing road kills or unscrupulous hunters, I'm just suggesting that what's trash for one animal is often dinner for another.

Primitive hunters were opportunists. If they could catch a lot of animals easily, they did so - even if it meant wasting resources. An early visitor to the Coeur d'Alene¹⁷ Indians of Idaho recounts a winter hunt during which the Indians, equipped with snowshoes, were able to walk up to deer sinking in the snow, which was unusually deep. The deer were so exhausted that the hunters did not even use bows and arrows, but merely seized them and snapped their necks. According to the account, they killed 600 deer during that excursion.

There are two other important ecological lessons to be drawn from this story. First, the Indians did not use arrows to hunt deer because arrows are expensive to make, in terms of energy. Hence, if the slaughter could be carried out without firing, the Indians saved their weapons. Second, with the deer already nearly dead, killing them carried little risk; therefore, many deer were killed. The Indians played the role of a top predator and probably reduced the deer population to a level more balanced with the available food resources. (This argument is used today by sport hunters to justify their activities. With certain reservations, I accept it).

When I lived on the Kobuk River in northwest Alaska one fall during the caribou migration south, I watched the local Eskimos hunt. The hunters waited for the caribou to begin swimming across the river, then, while the animals lay helpless in the water, the hunters drove their motorboats into the herd and shot the animals with rifles. A few hunters, who had perhaps seen too many cowboy movies, would lasso the caribou and tow them back to shore, where they would shoot them as the animals washed ashore-thereby saving the hunters having to drag the heavy bodies of animals out of the river. To most of us, conditioned by ideas about "fair play", this type of action seems unsportsmanlike. However, efficiency governs subsistence hunting; and, in the absence of an ethic, subsistence hunting may not differ substantially from commercial hunting, except that commercial hunting typically involves more resource extraction.

If humans are often wasteful of resources, how come there was so much wildlife left in North America when Europeans arrived? I have already given some of the reasons: the time it takes to invest in hunting, the absence of very effective weapons, etc. Another reason is that, while pursuing prey, the Indians had to deal with a restriction that we rarely consider today: attack by other human beings. George Catlin, the painter who traveled the Great Plains in the 1830s portraying Indian life, mentions these costs when he describes the Mandan, a tribe that lived on the upper reaches of the Missouri. "... being a small tribe and unwilling to risk their lives by going far from home [to hunt] and thus have to face more powerful enemies, they often end up in a state of near starvation."

¹⁶ "Slob hunting" in the original. *N. from t.*

¹⁷ Amerindian people of the Salish linguistic group. *N. from t.*

Manufacturing costs also limited catches. Most hunters did not shoot everything in their path because if they had, they would have lost their spears or their spear points. Making spears is work, and human behavior hasn't changed that much in the last 10,000 years. We can safely assume that these hunters would rather sit around the fire and brag about their exploits as hunters and lovers than spend their time making new spears.

Ishi, a California Indian who was "discovered" in 1911 and brought to San Francisco, where he was studied by anthropologist Alfred Kroeber, provides much insight into the attitudes of technologically primitive peoples. Kroeber's wife,

Theodora, in her book, *Ishi — In Two Worlds*¹⁸, described how Ishi made an arrowhead. "Ishi completed the carving and retouching¹⁹ of an arrowhead in approximately 30 minutes. He admitted that it was tiring work. The quick and smooth „click-click' of the falling flakes is best achieved if you don't change your posture and maintain a regular rhythm; It's a demanding job..."

Despite the difficulty of making hunting gear and the time required to capture prey, early humans could hunt prey populations to extinction—at least locally. Evidence suggests that the native Maori of New Zealand hunted moas, large flightless birds, to extinction; and many birds from the Hawaiian Islands disappeared shortly after the arrival of the Polynesian settlers.

It is not necessary to kill every last prey for their population to end up functionally extinct in terms of being able to support the predator group. Thus, a primitive people could kill most of the local deer population, until it became too costly to capture more deer. When this point was reached, those people either changed their food source (known as "prey switching") or occupied other territories (called "war" in our lexicon), or starved.

The size of wildlife populations fluctuates regularly due to many factors—including drought, fire, disease, and competition from other species whose population size fluctuates—as well as predation by hunters. natives. It has become common dogma to state that North America was populated from end to end by immense herds of elk, bison, pronghorn²⁰, mule deer²¹, white-tailed deer²², caribou and other smaller creatures. Undoubtedly, for most species, there were many more in North America before the arrival of the white man, but it would be a mistake to assume that these animal populations were static and evenly distributed.

Many newspaper references testify to the immense herds of bison that once roamed the Great Plains, but read them carefully and it becomes clear that these great congre-

¹⁸ There is an edition in Spanish: *Ishi, the last of his tribe*, Antoni Bosch SA, 2006. *N. from t.*

¹⁹ "The flaking and notching" in the original. Experimental archaeologists and Anglophone lithic carving fans refer to "flaking" as the extraction of flakes to shape the piece. With "notching" they refer to the carving of notches in the tips to facilitate gluing and mooring them to a shaft. *N. from t.*

²⁰ "Pronghorn antelope" in the original. *Antilocapra americana*. *N. from t.*

²¹ "Mule deer" in the original. *Odocoileus hemionus*. *N. from t.*

²² "White-tail deer" in the original. *Odocoileus virginiana*. *N. from t.*

gations were separated by many empty miles. Thomas Farnham, in his book *Travels in the Great Western Prairies*, wrote in 1839: "One of our party killed a tortoise, which has given us all an excellent supper. This has been the only hunt of any kind that we have seen since we left the border." Days later he wrote: "[The hunters] roamed the field all day looking for game, but found nothing. The countryside, being constantly exploited by Indian hunters, offered us little prospect of game."

Naturalist John Kirk Townsend, who in 1832 traveled through the Blue Mountains of Oregon - an area that today boasts one of the largest elk herds in the country - wrote: "The hunting has been exceedingly scant, with the exception of a few bush roosters²³, pigeons, etc. ...since we left the confines of buffalo country²⁴."

These people were traveling fast and no doubt missed the occasional deer hiding in the brush or herds of elk hidden behind a mountain. In any case, the wildlife then, like now, was not evenly distributed in space and time. Many areas were virtually deserts of fauna, at least in certain seasons, and most early hunting and gathering societies moved regularly from one concentration of resources to another. If the expected concentration did not come true, people would starve.

One reason for the abundance myth has to do with traveler reports and the misinterpretation of those reports. First, an immense concentration of animals is more likely to be mentioned than the absence of them. Second, we tend to interpret these references as applying to all landscapes. I once saw a caribou migration on the Brooks Range within the boundaries of the Arctic National Park²⁵. The moving animals seemed to fill the entire valley. Similar spectacles were observed by many of the first Europeans who ventured into the American West. However, if I had been able to travel quickly beyond that valley, I would not have found a caribou for miles around. However, it was tempting to imagine that caribou were abundant everywhere.

Time spent hunting and risk of being injured by prey or enemies, these are the costs imposed on the hunter from the outside. There are also self-imposed costs. Although they may have killed huge numbers of animals when possible, hunting peoples often followed codes of conduct designed to show respect for slaughtered animals. Whether this is ultimately due to a concern for the animals or rather a concern for the continued success of the hunters is debatable. Self-interest is not necessarily bad. One problem for members of technological societies is that we are unable to see the connection between our actions and their consequences. Early hunters felt that their personal actions influenced their hunting success and incorporated taboos and protocols into their culture to ensure favorable hunting conditions. The fact that people can and do impose codes of conduct on themselves is a positive human trait that brings meaning and hope of success to current conservation efforts.

²³ "Grouses" in the original. Common name in English for various species of birds of the Phasianidae family. *N. from t.*

²⁴ See footnote 14 in this same text. *N. from t.*

²⁵ "Arctic national Park" in the original. *N. from t.*

One of the contributing factors to many of our misinterpretations of what the natural world was like before European rule is our static sense of time. We assume that the way we found the environment is the way it always was. However, both wildlife and human populations experienced huge fluctuations in their size and distribution. For example, between AD 1,100 and 1,300, most of the Great Plains were deserted as a great drought struck those lands. There were no huge herds of bison then as described during the 19th century (when increased rainfall during the Little Ice Age²⁶ helped increase bison herds, perhaps to levels never before experienced); and as a result, few Indian tribes lived there. This same dry spell pushed the Pueblo Indians out of much of their territory in the Southwest, where extensive Indian-induced deforestation in arid canyon country exacerbated drought conditions.

As the drought subsided and bison herds began to recolonize the plains and prairies, the tribes gradually moved into the interior of the region. From the north came the Algonquian-speaking Blackfeet, who first settled southern Saskatchewan and moved to Alberta and Montana in the early 18th century, displacing the less aggressive Flathead tribe²⁷ that they were forced to relocate to less desirable territory west of the mountains. The Crow, of the Siouan language group, came from the eastern Great Lakes states and settled in eastern Montana. The Pawnee, of the Cadoan language group, moved into Kansas, and the Comanches, of the Shoshone language group, came to the southern plains from the Great Basin. Few if any of the tribes we commonly associate with the Great Plains have resided in their particular region for more than a few centuries. Some tribes invaded their territories at the same time or even after the first English, Americans, Spanish, and French established posts or colonies in the region. The Navajo arrived in the Southwest between 400 and 500 years ago, around the same time as the Spanish.

These tribes would have continued to move, expand, or decline, and some of them would have become extinct, had it not been for the white culture to come and take up residence for each of them on reservations. (The dominant culture has also done the same with wildlife and wilderness - all of which are confined to "reserves"). Normally, displacement means that a people with a more advanced technology occupy the lands of those with a lower technological level. We don't know if the Clovis people displaced others, because it was too long ago, but there are many examples throughout history of groups that are technologically advanced and able to obtain more resources, invading less sophisticated groups. This has nothing to do with race and can take place anywhere any group gains an advantage when it comes to resources and technology.

History books are full of examples of technologically superior and aggressive groups taking land and resources from less fortunate peoples. The Greeks dominated the Mediterranean thanks to the advantage of their sailing ships. The Incas, with their sophisticated system of roads, food storage, and other methods of resource control,

²⁶ Cold period from the beginning of the 17th century to the middle of the 19th century. *N. from t.*

²⁷ "Flathead" in the original. See footnote 14 in this same text. *N. from t.*

dominated other tribes throughout their empire in South America. The Japanese invaded the islands of Japan and relegated their original inhabitants to the northernmost of the islands in the archipelago. The North American tribes that first got horses expanded their territories at the expense of other tribes until other tribes got horses too. I do not try to excuse what happened, nor to justify these events as something morally correct because they are "natural". We do not accept many actions that occur in some animal and human cultures—such as infanticide, slavery, incest, deception, or warfare—nor do they always have long-term survival value for the individual or species.

Native American tribes provide examples of these types of actions. The Eskimos were the last immigrants we allowed ourselves to call "natives" by virtue of their previous occupation. The Eskimos arrived in North America about 3,000 years ago, long after the Indians had colonized the region. The Eskimos were technologically sophisticated, they thrived in cold areas, and within a few centuries they began to invade large stretches of the north. Some of these lands were not inhabited by humans, but in other areas, the Eskimos were in constant conflict with the Indians who had previously settled there. The word "Eskimo" is a derogatory Indian term meaning "raw meat eater," implying that the Eskimos were so brutish that they ate meat without cooking it. (The term used by the Eskimos to refer to themselves, "Inuit", means "the people".) By the 17th century, when Russian colonization began in Alaska, the Eskimos had displaced the Indian groups and lived far to the south of the area with which we normally associate the group, even occupying the southern coast of Alaska southeast of present-day Valdez.

Conflicts between Indians and Eskimos occurred long before European colonization. Between 1769 and 1774, Samuel Hearne of the Hudson Bay Company traveled overland through much of what is now Canada's Northwest Territories, becoming the first white man to do so. Accompanying Hearne was a group of Indians who acted as guides and interpreters. At what is now called Bloody Falls on the Coppermine River, Hearne's party came across an Eskimo encampment whom his Indians surprised and murdered, apparently simply because they were Eskimos. Hearne watched as an Eskimo girl was pinned to the ground and tortured. Hearne, horrified, pleaded with the Indians to show mercy for the girl; they finished her off reluctantly.

It is often assumed that the indigenous peoples of North America lived in harmony with each other and that this was broken by white culture. Certainly the westward migration and new weapons and diseases greatly disrupted intertribal relations, but some racial and tribal hatreds have a long history. Even today in Alaska, one Eskimo can insult another by saying that he "hunts like an Indian."

These conflicts raise questions about Indian land claims - such claims are commonly based on the assumption that, prior to the intrusion of European culture, all tribes lived in harmony, each group assigned its own inviolable territory. Indian groups constantly remind the dominant culture that they want *their* land back. If these demands are accepted, problems will arise due to conflicts between the different claims. Should the

Navajo, who invaded the homeland of the Pueblo Indians, be required to return north from whence they came? Should the Tlingit Indians, who invaded southeast Alaska 300 years ago, be expected to return to the interior of British Columbia where they lived before taking land from Eskimos, Haida and other groups? Should the flatheads be allowed to take back the lands east of the Rocky Mountains that the blackfeet took from them? A hierarchy based on length of residence in a particular area would be fraught with problems and would negatively discriminate against the many - Indians, whites, blacks, Asians and Mexicans - who came to the region late but have now made it their home. If the millions of these people who call America home are not "Native Americans," then what are they?

A complicating factor regarding Indian land claims is the question of whether the Indians were forcibly displaced. While armed conflicts between white settlers or cavalry and Indians certainly did occur, such as the tragic encounters at Wounded Knee and Battle Creek, many more Indians died from introduced diseases - against which they had little resistance - such as smallpox, than in such armed conflicts. The Blackfeet, for example, never lost a battle against the United States cavalry, but suffered incredible losses from introduced diseases. Cases have been documented of unscrupulous frontiersmen giving Indians smallpox-infected blankets to break Indian resistance. Entire tribes were all but destroyed, and the few survivors often starved to death because, weakened by disease, they were unable to make some important seasonal catch or harvest, such as taking advantage of a salmon migration. In many cases, white settlers did not so much forcefully seize land from Indians as simply occupy unpopulated or weakly defended territories. Thus, it was not only an invading culture and people that threatened the Indians, but also invasive diseases that tore apart the social fabric of the tribes and made them vulnerable to loss of territory. Even if the retreat of the frontier had not trapped the Indians, the introduced diseases would have dramatically changed the structure and composition of the tribes and their corresponding territories.

Our static view of human lands has contributed to the misconception that Indians were the "first environmentalists." The American Indians reached a relative equilibrium because their primitive technology allowed them to keep their population growth and environmental impacts in check to a great extent. Bows and arrows, although they had been in use in Europe and the Middle East for perhaps 8,000 years, were unknown in North America until 2,500 years ago. Its widespread adoption was a significant technological advance over spears. These changes in technology often cause social changes. For example, among the Plains Indians before the return of the horse²⁸, many tribes lived in small family units. Hunting bison on foot was risky, because a herd could easily run over a hunter. Many of the early Plains tribes grew corn as a supplement to their hunts. Despite these two mainstays of their economy - bison and corn - starvation was a

²⁸ The author, with the "return of the horse", refers to the fact that the horse already existed in America before the arrival of the Paleoindians, but it became extinct at the end of the Pleistocene and did not inhabit that continent again until the Spanish reintroduced it. *N. from t.*

regular occurrence and, like the animals they hunted, many tribes suffered population crashes followed by years of growth.

The horses that the Indians obtained from the first Spanish explorers represented an important cultural and technological change in the Indian societies. With the added mobility of the horse, hunting efficiency increased tremendously. Hunters could travel much farther following game and exploit regions previously inaccessible to them. They could transport the prey back to distant camps. The risk of bison hunting was reduced, making it easier to kill large numbers of animals. (Of course, riding a galloping horse through a stampede of bison was still risky, but it was safer than hunting on foot.) Like the Clovis men hunting mammoths, the Indians on horseback were a new type of predator against which the bison had few defenses. The evidence suggests that Indians on horseback exterminated marginal populations of bison, and one can speculate whether Indians might even have eventually eradicated bison had it not been for white colonization of the prairies ending the brief era of the Indian on horseback.

With the extra food provided by the use of the horse, the Indians increased their rate of nutrient intake, which led to higher birth rates and higher infant survival rates. Also, the greater food resources allowed the tribes to live in larger social units. Before the mobility brought about by the horse, large groups of hunting people were only possible for short periods as intense hunting in a local area would quickly eliminate prey. With this surplus of resources, the Plains Indians were able to devote their energy to ceremonies and warfare. George Catlin, in the 1830s, reported that "the Indians in their natural condition are continually at war with the tribes around them for the settlement of old and endless quarrels, as well as for the love of glory, which, according to the way of life of the Indians, can only be reached by following the path of war... their warriors die in such numbers that in many cases there are two and sometimes three women for each man in a tribe".

Despite the myths about the sacredness of life for the Indians, many tribes killed beavers and other species to exchange the skins for whiskey, blankets, rifles or other products. These products (except whiskey) made their lives easier. Some became necessities; failure to obtain rifles could condemn a tribe to expulsion by armed tribes.

Although American trading companies relied heavily on white trappers to supply them with fur, the Canadian Hudson Bay Company used Indian trappers almost exclusively and these Indians hunted many populations to extinction. The near extinction of the buffalo²⁹ was caused in part by Indian fur trappers. Thus, the Plains Indians were complicit in the demise of their own culture.

Many say that such activities were promoted by the arrival of the white merchandise trade that corrupted the Indians, who until then were pure. However, these claims ignore the facts that the Indians already traded regularly with each other and that they killed for "commercial reasons." In Alaska's Brooks Range, Eskimos killed excess caribou to trade the meat and hides with coastal groups for luxury items such as seal

²⁹ See footnote 14 in this same text. *N. from t.*

oil. Many tribes even traded slaves obtained in war. In the Plains tribes, women were treated little better than slaves and men frequently traded their daughters or wives for horses - the normal price was a woman for a horse.

Of course, there were Indians who loved the land. Today we refer to them as the "traditionalists," but they do not represent the typical attitudes of Indians any more than John Muir³⁰ represents the typical attitudes of Americans of European descent. Environmental awareness is as rare among American Indian and Eskimo descendants as it is in American culture as a whole.

Giving special consideration to Indian claims based on the assumption that they have a better right to speak in defense of the land carries a danger. Throughout the American West, Indian tribes generally show no more concern for the land than the dominant white culture of which they are largely a part. Many reserves are excessively logged, grazed, and hunted.

What I mainly want to point out here is that what has been presented as an environmental ethic of the Indians and Eskimos was rather the result of complex interactions between cultural beliefs and ecological constraints. Since culture is ultimately an adaptation to a set of particular environmental conditions, a change in conditions results in a change in cultural values.

This is clearly seen in the actions of the Indians and Eskimos who, although they defend the preservation of cultural traditions, are selective about what they want to preserve. For example, the Indians were allowed to kill bald eagles³¹ - an endangered species - because they claimed that the eagles' feathers were an essential part of their religious ceremonies. Although these Indians demanded exemption from the restrictions imposed by the Endangered Species Act³², few of them cared enough about the preservation of their culture to capture the eagles in the way that was done in the past - sitting long hours in a hiding place, under a bait, until an eagle approached, at which time the Indian grabbed it by the legs. This is a tedious and somewhat dangerous way of getting feathers, however it is as much a part of Indian tradition as using such feathers in ceremonies. Similarly, many Indians and Eskimos say they should have special hunting privileges, including the exclusive right to hunt certain species or take wildlife regardless of seasons or quotas. However, are not the making of arrows and spears, the construction of traditional shelters³³ or the carving of canoes from logs equally important for the preservation of Indian culture? These heavy tasks are often forgot-

³⁰ John Muir (1838-1914) was a Scottish-born American naturalist and conservationist. His philosophy about Wilderness and its conservation was highly influential in American society and culture. He founded the Sierra Club, the first conservation organization in history. *N. from t.*

³¹ *Haliaeetus leucocephalus*. *N. from t.*

³² "Endangered Species Act" in the original. American law that regulates the protection of endangered species. *N. from t.*

³³ "Sod hut" in the original. It would literally be "clod huts", in reference to a type of construction that was made in the Prairies, using sod (pieces of soil with herbaceous cover cut in the form of blocks). *N. from t.*

ten by those who claim to uphold the tradition. Should individuals who use ATVs, snowmobiles, rifles, nylon nets, and outboard motors be able to freely circumvent the restrictions placed on other hunters using the same equipment?

As a subset of modern society, most Indians and Eskimos are poor and have little power to direct their own lives. I do not blame Indian leaders for trying to exploit natural resources on their reservations or for other actions that contradict our myths about Indians. The Indians, in most cases, have been denied access to the wealth that the rest of the population has accumulated; and because of this we tolerate obvious contradictions with the myth of the ecologist Indian. However, if we want to protect the earth, we should demand that our laws be applied to all citizens equally.

Given the evolutionary history of human beings, I don't see the havoc wreaked on the earth by the American people as an unnatural perversion. Rather, I suspect that most of our environmental impacts are due to technology developing rapidly but our culture's response to constraining its actions slower. With few exceptions, it appears that all human beings - regardless of race or culture -, given the same opportunities, show the same lack of regard for the health of nature.

I believe that the concept that the Indians were the "first environmentalists" is more myth than reality, and is not so much the result of a conscious conservation ethic as of primitive technology that prevented them from extensively controlling natural forces. Whether a genuine land ethic existed in the past is debatable, but because of the ease of cultural transmission from one group to another, I contend that many, though not all, Indians and Eskimos today have essentially the same cultural values and the same technology as the rest of the American population.

I've given a bleak picture of human behavior, but it's important to realize that we all have the ability to act intelligently and respectfully. Although conservation is not a dominant human trait, it exists to some degree in all cultures. Who would deny that John Muir worshiped the Sierra³⁴ or that Aldo Leopold advocated reverence for the land? Concern for the earth may gradually become more prevalent as global crises demand such changes in attitude. It is this flexibility of cultural values to adapt to new environmental situations that brings a glimmer of hope to all of us concerned about human impact on the Earth.

³⁴ "Sierra", in Spanish in the original. The author refers to the Sierra Nevada of California. *N. from t.*

Presentation of “Primitive Communism”

The following is yet another text that refutes the idealization of primitive societies. Surprisingly, despite all the existing evidence, despite the data coming from anthropology, evolutionary psychology, biology, etc. or simply, despite mere albeit increasingly lacking common sense, many people, including many academics and intellectuals, and especially those with progressive ideological leanings, continue to project their own (post)modern values and ideas onto primitive peoples and believe (and making believe) that hunter-gatherers were egalitarian, feminist, peaceful, and the like. And once again, someone gives them hair.

Only two flaws in the text can be noted. The first is methodological and unimportant: the lack of references in the case of some data that appear in the text. Thus, the author does not give the sources of Engels’ funeral speech about Marx; nor does he give the bibliographic data for the *The Atlantic* article on Samuel Bowles and Jung-Kyoo Choi or the anthropology textbook from which he took the quote on private property; nor does it say who are the ones who rightly call Turnbull’s objectivity into question.¹

However, more important than the lack of bibliographic rigor is that the author’s questioning of the myth of primitive communism is motivated by his interest in promoting progressive ideas and values and, with them, the development of the techno-industrial society. The author, like most of the defenders of primitive communism whom he criticizes, really wants to build a “better” modern society, not destroy it. What happens is that simply, and in a somewhat logical way, he considers that delusion and delusion about primitive societies is counterproductive to achieve his progressive ends. These types of authors hope that by showing the “bad” or unpleasant parts (at least bad or unpleasant for the current progressive mentality) of the primitive way of life: inequality, material discomfort, violence, infanticide, gerontocide, etc., their The public will applaud and embrace the “achievements” of civilization and the humanist concept of progress and will not question them, and even openly defend them. However, there are good reasons to reject civilization and techno-industrial society, and even to prefer primitive living conditions to modern ones, which have nothing to do with the idealization of primitives. For example, regardless of whether these primitive societies

¹ A possible reference to the lack of objectivity of Colin Turnbull’s reports on the Mbuti would be: Robert Edgerton, *Sick Societies: Challenging the Myth of Primitive Harmony*, Free Press, 1992, page 6.

were egalitarian, supportive, peaceful, etc. or not, the fact is that they generally did much less harm to wild Nature (including human nature) than civilized societies. And even less than the techno-industrial society, however "green" it may be.

Be that as it may, the data provided by the author remain valid regardless of his progressive ideology. And that's why we published the text.

Primitive Communism: Marx's idea that before agriculture and animal husbandry societies were egalitarian and communal by nature is highly influential and quite wrong.²

By Manvir Singh

Karl Marx died on March 14, 1883. At the funeral that took place three days later, Friedrich Engels spent little time talking about their friendship over the previous 40 years and focused on Marx's legacy. "Just as Darwin discovered the law of development of organic nature," said Engels, "Marx discovered the law of development of human history." His friend had died being "loved, revered and mourned by millions of fellow revolutionary workers - from Siberia to California, throughout Europe and America... His name and work will endure through the centuries!"

Engels made sure of it. In the years that followed, he devoted himself to organizing and publishing Marx's ideas. From a hodgepodge of fragments and revisions, he produced the second and third volumes of *Das Kapital*, in 1885 and 1894 respectively. He intended to publish a fourth volume, but died before achieving it. (It was later published as *Theories of Surplus Value*.) Even so, the most peculiar project born of Marx's notes was published a year after his death. Engels called it *The Origin of the Family, Private Property and the State*. I'll call it *The Origin*, for short.

The Origin is like Yuval Noah Harari's *bestseller Sapiens* (2014) but written by a 19th century socialist: a comprehensive look back at the dawn of property, patriarchy, monogamy and materialism. Like many of his contemporaries, he placed societies on an evolutionary scale that ranged from savagery to civilization to barbarism. Although *The Origin* was wrong in most ways, it has recently been described by one historian as "one of the most important and politically applicable texts in the Marxist canon",

² Translation by Último Reducto of the article "Primitive Communism: Marx's idea that societies were naturally egalitarian and communal before farming is widely influential and quite wrong", published in *Aeon*, 19 April 2022. The original article can be read at: [[https://aeon.co/essays/the-idea-of-primitive-communism-is-as-seductive-as-it-is-wrong?utm_source=Aeon Newsletter&utm_medium=email&&utm_campaign=launchnlbanner](https://aeon.co/essays/the-idea-of-primitive-communism-is-as-seductive-as-it-is-wrong?utm_source=Aeon%20Newsletter&utm_medium=email&&utm_campaign=launchnlbanner)][<https://aeon.co/essays/the-idea-of-primitive-communism-is-as-seductive-as-it-is->]

which has had a profound influence on everything from feminist ideology to divorce policies in Maoist China.³

Among all the legacies of said text, the most popular is primitive communism. The idea is as follows: a long time ago, private property was unknown. Food reached those who needed it. He took care of everyone. Then, agriculture appeared and, with it, property over the land, over work and over natural resources. The organic community was crushed to pieces under the weight of the competition. This whole story predates Marx and Engels. The patron saint of capitalism, Adam Smith, would have already proposed something similar, as would the 19th century American anthropologist Lewis Henry Morgan. Even ancient Buddhist texts already described a property-free pre-state society. However, *The Origin* was the most important systematization of early communism. He advocated for this idea, spread it widely and linked it to Marxist principles.

Even today, many writers and scholars continue to treat early communism as historical fact. To take an influential example, the economists Samuel Bowles and Jung-Kyoo Choi have been arguing for 20 years that property rights co-evolved with farming and ranching. For them, the question is not so much whether private property preceded agriculture and livestock, but *why* it appeared at that time.⁴ In 2017, an article in *The Atlantic* reviewing the work of these authors stated flatly: "For most of human history, there was no such thing as private property." One of the main textbooks of anthropology reflects the supposed consensus when it says: "The concept of private property is far from universal and tends to appear only in complex societies with social inequality."

Historical narratives are important. In his bestselling *Humankind* (2019),⁵ Rutger Bregman takes the fact that "our ancestors had hardly any notion of private property" as evidence of the existence of a kindness essential in humans. In *Civilized to Death* (2019),⁶ Christopher Ryan writes that pre-agricultural societies were characterized by "*compulsory sharing of minimal property, free access* to the resources to meet vital needs and a sense of *gratitude* towards an environment that provided what was needed". As a result, he concluded: "The future that I imagine (that there will be one day) is very similar to the world that our ancestors inhabited..."

Primitive communism is attractive. It promotes an Edenic image of humanity, one in which modernity has perverted our natural goodness. However, it is precisely for this reason that we should question it. If a century and a half of research on humanity has taught us anything, it is to be skeptical of the seductive. From the science of races to the noble savage, the history of anthropology is littered with the carcasses of convenient

³ Tristram Hunt in the introduction to the 2010 edition of *The Origin of the Family, Private Property and the State* from Penguin Books. *N. from t.*

⁴ "Coevolution of farming and private property during the early Holocene", *PNAS* vol. 110 No. 22, May 13, 2013, pgs. 8830-8835.

⁵ *Human Kind: A hopeful History*, Bloomsbury Publishing, 2020.

⁶ *Civilized to Death: The Pnce of Progress*, Avid Reader Press/Simon & Schuster, 2019.

stories, of narratives that misconstrue human diversity to further ideological ends. Is primitive communism any different?

According to the Aché, who were hunter-gatherers who lived in Paraguay, they knew Kim Hill when he was a child. They adopted him, raised him and taught him their language. Hill, however, remembers their first meeting differently. It was Christmas 1977. I was 24 years old. He had persuaded the Peace Corps to fly him to a Catholic mission with recently contacted hunter-gatherers. Hill told me that he was received by a priest, but “he had many obligations to attend to on the border with Brazil. So he drove me to the mission, left me there and said ‘here are the keys to my house’. So the priest left for two weeks. Thus began “an adventure more exciting and fun than I could have imagined.”

The Ache whom Hill first met had recently been contacted and had settled on the mission. They didn’t know how to farm, so they regularly packed up their things and headed into the jungle, sometimes for weeks. The priest warned Hill not to join them on the trips. “He said, ‘You don’t have enough skills; it’s really hard; they’re going to walk really fast, they won’t be able to eat their food’; bla bla bla”. So, “Of course, the first thing I did was completely ignore his warning.”

The first excursion was tough. The Aché did not wear clothes, so Hill went barefoot and wore nothing but running shorts. The jungle destroyed his feet. Vines and thorny plants lacerated his legs. He would later write in his diary: “I have seen my blood each and every day for the past month.” At night, the Ache slept on the ground. Trying to stay warm, the children were crawling on the Hill, making it difficult for her to sleep for more than 10 minutes at a time. He enjoyed the meat they hunted, but was less prepared for the hundreds of fat palm larvae that stood between him and starvation.

It was during that first trip that Hill saw that the Aché shared meat. A man returning from a hunt dropped an animal in the middle of the camp. Another person, the butcher, prepared piles of meat for each family. A third person handed them out. “So it seemed like a logical thing to do,” says Hill. The scene reminded him of a family barbecue where everyone gets a plate.

Yet the longer he lived with the Ache, the more amazing the sharing of meat became. The men were forbidden to eat the meat they got. Their wives and children received no more than anyone else. When he later built detailed genealogies, he discovered that, contrary to what he expected, members of the same band were often not related. And most importantly, the sharing of food did not only happen on special days. It was something that happened on a daily basis, a central psychological and economic part of Ache society.

What he began to see, in other words, was “an almost pure communalism; And I never thought that was possible.”

Hill’s trip to Paraguay got him hooked on anthropology. After serving in the Peace Corps, he returned to the United States and wrote a doctoral thesis on Ache hunting-gathering. Today, four decades later, he is a professor of anthropology at Arizona

State University and is known for his work on hunter-gatherers and remote peoples. According to his CV, he has spent 190 months - almost 16 years - doing fieldwork.

Not all of that work has been with the Ache. In 1985, he began working with another group, the Hiwi of Venezuela. I did not expect there to be dramatic differences from the Ache. The Hiwi were hunter-gatherers as well. The Hiwi also lived in the lowlands of South America. However, Hiwi society seemed to be a new world.

The Aché lived in mobile bands of between 20 and 30 people. The Hiwi lived in villages of over 100 people for most of the year. The Aché did not use drugs or dance. The Hiwi snorted hallucinogens and had tribal dances almost daily. The Ache spent most of each day trying hard to get food. The Hiwi hunted and gathered for just a couple of hours, preferring to relax in their hammocks. The Aché constantly divorced. The hiwi, practically never.

And, in addition, there was the distribution of food. In primitive Ache communism, hunters had little control over distribution: they could not support their families, and food flowed as needed. None of this applied to the Hiwis. When meat arrived in a Hiwi village, the hunter's family kept a larger portion for themselves, sparsely distributing lots to three other families out of 36. Put another way, as Hill and colleagues wrote in 2000 in the journal *Human Ecology*, "most families receive nothing when a food resource arrives in the village."⁷

The distribution of the Hiwi tells us something important about early communism: hunter-gatherers are diverse. Most are less communist than the Aché. When we study hunter-gatherer societies, for example, we find that hunters enjoyed special rights in many communities. They kept trophies. They consumed the organs and marrow before making the distribution. They received the tastiest parts and had exclusive rights to the distribution of the hunted animal.

The most important privilege that hunters had was to select who would receive the meat. Selective sharing is powerful. It establishes a bond between the giver and the receiver that the giver can turn to when needed. To refuse to share, in turn, is to deny friendship, a way of expressing animosity. When anthropologist Richard Lee lived with the !Kung of the Kalahari, he once noted that a hunter named N!eisi ignored his sister's husband when he was handing out the meat of a warthog. When asked why, N!eisi dryly replied, "I want to eat this with my friends." N!eisi's brother-in-law took the hint and, three days later, left the camp with their wives and children. By exercising control over distribution, hunters turn meat into relationships.

Let's say that owning something means excluding others from enjoying its benefits. I have an apple when I can eat it and you can't. You own a toothbrush when you can use it and I don't. The special privileges of hunters were situated along a continuum of property rights, from fully public to fully private. The more benefits they could

⁷ Michael Gurven, Kim Hill, Hillard Kaplan, Ana Hurtado, and Richard Lyles, "Food Transfers among Hiwi Foragers of Venezuela: Tests of Reciprocity," *Human Ecology* vol. 28 no. 2, June 2000, pgs. 171-218.

monopolize - from trophies to organs to social capital - the more they could be said to own their meat.

Compared to the Ache, many mobile hunter-gatherers who lived in bands were situated closer to the private end of the property continuum. Agta hunters in the Philippines set aside meat to trade with farmers. In Central Africa, the meat brought back by a lone efe hunter was “entirely his and he could share it as he wished”. And among the Sirionó, an Amazonian people who speak a language closely related to that of the Aché, faced with hoarding food, people could do little more than “go out and get their own.” The sharing of the Aché could embody primitive communism. However, Hill admits that “the Ache are probably an extreme case”.⁷

Hunter privileges are uncomfortable narratives for early communism. Even more damning, however, is a simple, unadorned fact: all hunter-gatherers owned private property, even the Ache.

Ache individuals possessed bows, arrows, axes, and kitchen utensils. The women owned the fruit they picked. Even meat became private property once it was distributed. Hill explains: “What if I left my armadillo leg on [a fern leaf], went to the jungle for a moment to urinate, and when I came back someone would have taken it? Effectively, that would be considered theft.”

Some of the defenders of early communism accept that the hunter-gatherers owned small trifles but insist that they did not own the natural resources. However, this is also wrong. Shoshone families owned eagle nests. The Atapascanos of Lago del Oso had beaver dens and fishing areas. Tree ownership was especially common. When an Andaman Islander came across a tree suitable for making canoes, he told his fellow group members. From that moment on, the tree was his and his alone. Similar rules existed among the Deg Hit’an of Alaska, the Northern Paiute of the Great Basin, and the Enlhet of the arid plains of Paraguay. In fact, according to one economist’s estimate, more than 70 percent of hunter-gatherer societies recognized private ownership of land and trees.⁸

Respect for property rights becomes clearer when someone violates them. To appreciate this, consider the Mbuti, one of the small-statured hunter-gatherers (“pygmies”) of Central Africa.

Much of what we know about Mbuti society comes from Colin Turnbull, a British-American anthropologist who spent the late 1950s with them. Turnbull was kind, strong, and brave. From 1959 until his death, he was openly in an interracial gay relationship and ended up resigning from his position at the American Museum of Natural History, claiming that he and his partner were discriminated against. He spent his last years campaigning for death row inmates and, after his death, donated all his belongings and savings to the United College Fund for Blacks.⁹ “Throughout his life,” wrote

⁸ Frederick L. Pryor, *Economic Systems of Foraging, Agricultural, and Industrial Societies*, Cambridge University Press, 2005.

⁹ “United Negro College Fund” in the original. *N. from t.*

one biographer,¹⁰ “Turnbull was motivated by a deep-seated desire to find goodness, beauty, and power in the oppressed or ridiculed, and thus to make those qualities known to the world. , reveal the evil of Western civilization”.

According to some, these motivations clouded Turnbull’s descriptions of the Mbuti. He has been criticized for presenting an “idealized image” of the Mbuti as “simple and childish creatures” who led “a romantic and harmonious life in the lush rainforest”. However, even romanticized, his writings would still undermine the claims for early communism. He described a society in which theft was prohibited and in which even its most desperate members suffered if property rights were violated.

Take, for example, Pepei, an Mbuti man who in 1958 was 19 years old and not yet married. Unlike most bachelors, who slept near the fire, Pepei lived in a shack with his younger brother. However, instead of collecting building materials, he swiped them. He would sneak out at night, tearing a leaf from this hut and a branch from that. He also stole food. After all, he was an orphan, and he was single, so he had no one to help him prepare meals. When food mysteriously disappeared, Pepei always claimed to have seen a dog take it away.

“No one really cared about Pepei’s shoplifting,” says Turnbull, “as he was born with a gift for comedy and was a great storyteller. But when he stole old Sau, he went too far.”

Old Sau was a thin and quarrelsome widow. He lived two shacks from Pepei and one night he caught him sneaking into his shack. As he was lifting the lid off a pot, she shook him with a pestle, grabbed his arm, twisted it behind his back, and dragged him outside.

Justice was brutal. Men ran from their huts and seized Pepei, while the youths ripped out thorny branches and lashed him with them. In the end Pepei managed to escape and ran into the jungle screaming. He returned to camp after 24 hours and went straight to his hut without being seen. “His hut was between mine and Sau’s,” Turnbull says, “and I heard him come in, and I heard him cry softly because even his brother didn’t want to talk to him.”

Other hunter-gatherers punished theft as well. The Colorado Utes whipped thieves. The Ainu of Japan cut off their earlobes. For the Yaghan of Tierra del Fuego, accusing someone of theft was a “deadly insult.” Lorna Marshall, who spent years living with the !Kung of the Kalahari, tells of a man who was killed for taking honey.[1550] Hunter-gatherers materialized private property by applying violence to offenders.

Is primitive communism just another seductive but incorrect anthropological myth? For one thing, no hunter-gatherer society was without private property. And even if they shared food, most of them compensated this sharing with special rights. On the other hand, living in a society like the Ache was a master class in sharing. It is hard to imagine farmers carrying out a redistribution of necessary resources on such a scale.

¹⁰ Roy Richard Grinker, *In the Arms of Africa The Life of Colin Turnbull*, The University of Chicago Press, 2000.

Whatever we call it, the economy of casting that Hill observed when he was with the Ache is not a reflection of any Edenic goodness that we have lost. Rather, it arose from a simpler source: interdependence. Ache families depended on each other for survival. We share with you today so that you can share with us next week, or when we are sick, or our pregnant women. Hill once saw a man fall out of a tree and break his hip. "It couldn't walk for three months, and in those three months, it didn't produce any food," Hill says. "And one might have thought that he and his family would starve. However, that did not happen, of course, since everyone supplied him with provisions during all that time.

This has to do in part with reciprocity. However, it also has to do with something deeper. When people are trapped in webs of interdependence, they care about the well-being of others. If I depend on three other families to keep me alive and feed me when I can't get it, I will not only want to maintain ties with them, I will also want them to be healthy, strong and capable.

Interdependence may seem enviable. However, it generates a cruelty that is often overlooked in the discourse in favor of primitive communism. When a person goes from being a lifesaver to being a long-term burden, the reasons for keeping them alive may vanish. In their book *Aché Life History* (1996),¹¹ Hill and the anthropologist Ana Magdalena Hurtado mention many Aché people who were killed, abandoned or buried alive: widows, sick people, a woman blind, a premature baby, a boy with a paralyzed hand, a boy who had a "strange appearance", a girl with a bad case of hemorrhoids. This opportunism pervades all human social interactions. However, it is most intense among hunter-gatherers living on the edge of subsistence, for whom cooperation is essential and futile effort can be fatal.

Consider, for example, how the Ache treated orphans. "We really hate orphans," said one Ache person in 1978. Another Ache woman told her son, after seeing jaguar tracks:

Hey, don't cry. Do you want your mother to die? Do you want to be buried with your dead mother? Do you want to be thrown into the grave with your mother and stepped on it until the excrement comes out? Your mother is going to die if you keep crying. When you are an orphan no one will take care of you again.

The Ache had one of the highest infanticide and child homicide rates ever known. Of all children born in the jungle, 14 per cent of boys and 23 per cent of girls, almost all of them orphans, were killed before they reached the age of 10. A child who lost his mother during the first year of life was always executed.

(Since their acculturation, many Aché have refused to kill children and babies. In *Aché Life History*, Hill and Hurtado publish an interview with a man who had strangled a 13-year-old girl almost twenty years earlier. "He asked us to forgive him," they say, "and admitted that he never should have done this task and that he simply 'didn't think about it'".)

¹¹ *Aché Life History: The Ecology and Demography of a Foraging People*, Routhledge, 1996.

Hunter-gatherers share because they have no choice. They worry that their band-mates' stomachs are full because their very survival depends on it. However, once that need is gone, even friends are expendable.

The popularity of the idea of primitive communism, especially in the face of evidence to the contrary, tells us something important about why narratives are successful. Early communism may not portray hunter-gatherer societies correctly. Yet it is simple, and it fits with widely held beliefs about the trajectory of human history. If we assume that societies went from being small to being large, or from being egalitarian to being despotic, then it makes sense that there was also a transition from propertyless harmony to selfish competition. Even when the facts refute the existence of primitive communism, the story sounds good.

Even more important than the simplicity and resonance of his narrative, however, is the political expediency of early communism. For anyone hoping to criticize existing institutions, primitive communism presents modern society as the perversion of a more prosocial human nature. However, storytelling is counterproductive. By contrasting an angelic past with our ambitious present, primitive communism blinds us to the true determinants of trust, liberty, and fairness. If we want to build better societies, the way to achieve it is neither to live as hunter-gatherers nor to trumpet an imaginary state of nature. Rather, it is working with human beings as we are, with all our imperfections.

4. Texts on the theory of social development .

Understanding how complex social systems develop and function can be very difficult, especially if the various factors that affect these processes are not adequately taken into account. However, such an understanding is fundamental to correctly assessing whether and how civilization, in general, and techno-industrial society, in particular, can or should be reformed or, on the contrary, should disappear.

The texts that appear in this section can help to achieve, at least in part, this understanding of the development processes of social systems.

- Complexity, problem solving and sustainable societies . By Joseph A. Tainter.
- The collapse of complex societies: summary and implications . By Joseph A. Tainter.
- The shadow of the past. By Clive Ponting.
- The energy limits of economic growth. By James H. Brown, William R. Burnside, Ana D. Davidson, John P. DeLong, William C. Dunn, Marcus J. Hamilton, Norman Mercado-Silva, Jeffrey C. Nekola, Jordan G. Okie, William H. Woodruff and Wenyun Zuo.

COMPLEXITY, PROBLEM SOLVING AND SUSTAINABLE SOCIETIES[i]

By Joseph A. Tainter

INTRODUCTION

In our quest to understand sustainability, we have struggled to understand factors such as energy transformations, biophysical limits, and environmental degradation, as well as the human characteristics that drive production and consumption, and the assumptions of neoclassical economics. As our knowledge of these issues increases, practical applications of ecological economics are emerging. But even with these advances, something important is missing. Any human problem is nothing but a moment of reaction to previous events and processes. Historical patterns mature over generations and even centuries. Hardly the experience of a lifetime will fully reveal the reasons for an event or a process. Employment levels in the production of natural resources, for example, may respond to a cycle of capital investment with a latency period of several decades (Watt 1992). The factors that cause societies to collapse take centuries (Tainter 1988). To carry out current and future policies we need to understand social and economic processes on their time scales and understand where we are within a historical pattern. Historical knowledge is fundamental to sustainability (Tainter 1995a). No program to improve sustainability can be considered practical if it does not incorporate this fundamental knowledge.

In this era of global environmental change, we are facing what may be humanity's greatest crisis. The set of transformations mentioned as global change leave all previous experiences in their infancy in terms of speed, the geographical scope of its consequences and the number of people that will be affected (Norgaard 1994). Still, many times in the past human populations have faced extraordinary challenges, and the difference between their problems and ours is only orders of magnitude. One might expect that, in a society that solves its problems rationally, we would urgently seek to understand historical experiences. In reality, our educational models and our impatience for innovation have made us refractory to historical knowledge (Tainter, 1995a). In their ignorance, politicians tend to look for the causes of events only in the re-

cent past (Watt 1992). As a result, although we have greater opportunities than any previous human group to understand the underlying reasons for our problems, those opportunities often go unnoticed. Not only do we not know where we are in history, but most of our fellow citizens and politicians are not as aware as they should be.

A recurring limitation faced by previous societies has been the complexity in solving problems. It is a limitation that generally goes unnoticed in contemporary economic analyses. In the last 12,000 years, human societies seem to have developed, almost inexorably, towards greater complexity. Most of them have been successful: complexity offers advantages, and one reason for our success as a species has been our ability to "rapidly increase the complexity of our behavior" (Tainter 1992, 1995b). But complexity can also be harmful to sustainability. Since the way to solve our problems has been to develop the most complex society and economy in human history, it is important to understand the price that earlier societies had to pay when they followed similar strategies. In this chapter I will discuss the factors that caused earlier societies to collapse, the economic principles of complexity in problem solving, and some implications of historical patterns for our efforts to solve current problems. This discussion points out that part of our response to global change has to be to understand the long-term evolution of problem-solving systems.¹

THE DEVELOPMENT OF SOCIOECONOMIC COMPLEXITY

Complexity is a key concept in this essay. In a previous study, I rated it as follows:

Complexity is generally understood to refer to such things as the size of a society, the number and different kinds of component parts, the variety of specialized roles it embodies, the number of different personalities present, and the variety of mechanisms to organize all of this into a coherent and functional whole. As any of those dimensions increase, the complexity of society increases. Hunter-gatherer societies (as a way of illustrating the contrast with complexity) possessed no more than a few dozen different social personalities, while modern European censuses recognize between 10,000 and 20,000 different occupational roles, and industrial societies can have, collectively, more than a million different types of social personalities (McGuire 1983; Tainter 1998)²

To illustrate a simple difference in complexity, Julian Steward pointed to the contrast between Native Americans, among whom early ethnographers documented 3,000 to 6,000 cultural items, and the US Army, which stationed Casablanca in the Second World War. World War, more than 500,000 types of artifacts (Steward 1955). The complexity is quantifiable.

For more than 99% of human history we have lived as low-density hunter-gatherers³ or farmers in egalitarian communities of no more than a few dozen people (Carneiro 1978). Leslie White pointed out that in such cultural systems, which were largely

¹ Adapted from Pedro Prieto's translation of "Complexity, Problem Solving, and Sustainable Societies," *Getting Down to Earth*, Island Press (1996). *Untamed Nature Note*.

² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity*.

³ "Foragers" in the original. *N. by NI*

based on human labor, only about 1/20 horsepower per capita could be generated per year (White 1949, 1959). From this base of undifferentiated societies requiring small amounts of energy, the development of complex cultural systems was, a priori, quite unlikely. The conventional wisdom has been that human societies have a latent tendency toward greater complexity. Complexity was supposed to be desirable and the logical result of too much food, too much leisure, and too much human creativity. Although this is the generally assumed scenario, it is not adequate to explain the evolution of complexity. In a world of cultural complexity there is, to put it colloquially, nothing free. Complex societies are more expensive to maintain than simple ones and require higher levels of contribution per capita. A more complex society has more subgroups and social roles, more networks between groups and individuals, more horizontal and vertical controls, a greater flow of information, greater centralization of information, more specialization and greater interdependence between the parties.

Increasing any of these dimensions requires biological, mechanical, or chemical energy. In the days before the introduction of fossil fuels, the increase in the complexity of a society generally meant that the majority of its population had to work more (Tainter 1988, 1992, 1994a, 1995a, 1995b).

There are many aspects of human behavior that appear to be averse to complexity (Tainter 1995b). The so-called “complexity of modern life” is a commonplace in popular discourse. Part of the public discontent with governments stems from the fact that government adds complexity to people’s lives. In science, the principle of Occam’s razor⁴ remains attractive, because it states that simplicity is preferable to complexity in explanations.

Complexity has always been inhibited by the burden of time and energy it imposes and by a revulsion at complexity (which is no doubt related to cost). Therefore, explaining why human societies are becoming increasingly complex is more challenging than is generally believed. The reason why the complexity increases is because most of the time it works. Complexity is a problem-solving strategy that arises under conditions of compelling necessity or perceived benefit. Throughout history, the stresses and challenges that human populations have faced have often been resolved by becoming more complex. Although it is not possible to do a complete review here, this trend is evident in the following fields:

1. Hunting-gathering and farming (Boserup 1965; Clark and Haswell 1966; Asch *et al.* 1972; Wilkinson 1973; Cohen 1977; Minnis 1995; Nelson 1995)
2. Technology (Wilkinson 1973; Nelson 1995)
3. Competition, war and arms race (Parker 1988; Tainter 1992)
4. Sociopolitical control and specialization (Olson 1982; Tainter 1988)
5. Research and Development (Price 1963; Rescher 1978, 1980; Rostow 1980; Tainter 1988, 1995a)

⁴ Philosophical principle due to William of Occam that says that the best theory is the one that uses the least number of elements when explaining a phenomenon. *N. by NI*

In each of these areas, complexity increases through further differentiation, specialization, and integration.

The development of complexity is therefore an economic process: complexity implies costs and provides benefits. It is an investment and provides a variable return. Complexity can be both beneficial and detrimental. Its destructive potential is evident in historical cases where increased spending from socioeconomic complexity comes to offer diminishing returns and ultimately, in some cases, negative returns (Tainter 1998, 1994b). This result arises from the normal economic process: simple and cheap solutions are adopted before more complex and expensive ones. Thus, as human populations have increased, hunting and gathering have given way to increasingly intensive agriculture and industrialized food production that consumes more energy than it produces (Clark and Hasevall 1966; Cohen 1977; Hall & et al. 1992). The production of minerals and energy has been changing, continuously, from easily accessible and cheaply exploited reserves to those that are more expensive to find, extract, process and deal with. to distribute.

Socioeconomic organization has evolved from equal reciprocity, provisional leadership, and rules of thumb to complex hierarchies with increasing specialization.

The graph in Figure 1 is based on these arguments. As society grows in complexity, it expands its investments in such things as resource production, information processing, administration, and defense. The benefit/cost curve for these expenses may increase, favorably, initially, while the simplest and cheapest solutions are adopted (a phase not shown in this graph). But as society encounters new stresses and cheap fixes are not enough, it evolves in a more expensive direction. Eventually, a growing society reaches a point where continued investments in complexity pay higher dividends, but at a decreasing marginal rate. At a point like (B1, C1) in this graph, a society has entered the phase where it becomes vulnerable to collapse.⁵

At this point, two things make a society prone to collapse. The first new emergencies affect people who are investing in a strategy that produces diminishing marginal returns. As that society weakens economically, it has fewer reserves with which to face great adversity. A crisis that society could have survived at first, now becomes insurmountable.

Second, diminishing returns make complexity less attractive and fuel discontent. As taxes and other costs rise and there are fewer benefits at the local level, more and more people are attracted to the idea of becoming independent. Society “breaks down” as people seek to meet their immediate needs rather than the long-term goals of their leaders.⁶

Complexity levels

Figure 1. Diminishing returns versus increasing complexity (from Tainter 1988).

⁵ Original title: *The Vanishing face of Gaia*.

⁶ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

As this society moves along the curve of diminishing marginal returns beyond (B2, C2), it crosses a point such as (B1, C3) where costs are rising, but returns have actually fallen to those levels previously available at a lower level of complexity. It is the realm of negative returns on investments in complexity. A society would discover at this point that the costs of investments in complexity would increase appreciably just before the collapse. A society in these conditions is extremely vulnerable to collapse.

This reasoning, developed and tested to explain why societies break down (Tainter 1988), is also a record of historical trends in the economics of problem solving. The history of cultural complexity is the history of the resolution of human problems. In many of the sectors in which investment occurs, such as resource production, technology, competition, political organization, and research, complexity increases as a continual need to solve problems. Since the simplest solutions are already exhausted, problem solving moves inexorably toward greater complexity, higher costs, and diminishing returns. This does not necessarily lead to collapse, but it is important to understand the conditions under which it can occur. To illustrate these conditions, it is useful to take a look at three examples of the increasing complexity and high price of problem solving: the collapse of the Roman Empire, the development of industrialism, and trends in contemporary science.

The collapse of the Roman Empire

One of the consequences of the diminishing returns of complexity, is verified with the fall of the Roman Empire of the West. Like any high-tax society based on solar energy, the empire had few fiscal reserves. When faced with military crises, the Roman emperors had to respond by devaluing silver coins (figure 2) and trying to raise new revenue. In the third century AD, constant crises forced the emperors to double the size of the army and also increase the size and complexity of the government. To pay for this, mass amounts of worthless coin were produced, peasants' supplies were requisitioned, and the level of taxation became even more oppressive (up to two-thirds of the net return after rent was paid). Inflation devastated the economy. Land and population were surveyed throughout the empire and valued for taxes. Communities were made responsible for non-payments. As peasants starved or had to sell their children into slavery, gigantic fortifications were built, the bureaucracy doubled in size, administration became more complex, large gold subsidies were paid to Germanic tribes, and new cities were established. With increased taxes, unproductive land was abandoned and the population dwindled. Peasants could not support large families. To avoid such oppressive civic obligations, the wealthy left the cities to settle on self-sufficient rural estates. Finally, to escape taxes, the peasants voluntarily entered into feudal relations with these landowners. A few wealthy families held so much land in the western empire that they felt capable of challenging imperial rule. The empire had to sustain itself by consuming its most important resources: productive land and the peasant population (Jones 1964, 1974; Wickham 1984; Tainter 1988, 1994b). The Roman Empire provides the best documented example in history of how increasing complexity in solving problems leads to higher costs, diminishing returns, loss of public

support, economic weakness, and collapse. In the end he could no longer solve the problems of his own existence.

Figure 2. Devaluation of Roman silver coinage, AD 0-269 (from Tainter 1994b with modifications). The chart shows grams of silver per denarius (the basic silver coin) from AD 0 to 237 and per half denarius from AD 238 to 269 (when the denarius was replaced by a larger coin valued at two denarii).</ em>

Population, resources and industrialism

The fate of the Roman Empire is not the inevitable fate of complex societies. It is useful to discuss a case that turned out quite differently. In one of the most interesting works in economic history, Richard Wilkinson (1973) showed that in late medieval and post-medieval England, population growth and deforestation stimulated economic development and were, at least partially responsible for the Industrial Revolution. Large population increases around 1300, 1600, and at the end of the 18th century led to the intensification of agriculture and industry. As forests were cut down to provide farmland and fuel for that growing population, England's needs for heating, cooking, and manufacturing could not be met simply by burning wood. Coal began to become more and more important, although it was reluctantly adopted. Coal was more expensive to obtain and distribute than wood, and its deposits were only found in certain places. They demanded a new and expensive distribution system. As coal became more important in the economy, the most accessible deposits were depleted. Deeper and deeper mines had to be dug, until groundwater became a problem. Finally, the steam engine was developed, which was used to pump water from the mines. With the development of a coal-based economy, a distribution system, and the steam engine, some of the most important technical elements of the Industrial Revolution were set in motion. Industrialism, that great generator of economic well-being, came, in part, from the steps taken to counteract the consequences of resource depletion, which are supposed to be a generator of poverty and cause collapse. But it was a system of increasing complexity that was soon showing diminishing returns in some quarters. We will return to this point later.

Science and problem solving

Contemporary science is the greatest human exercise in problem solving. Science is an institutional aspect of society and research is an activity that we like to believe offers great benefits. Because generalized knowledge is established early in the history of a particular discipline, the work that remains to be done becomes increasingly specialized. These types of problems tend to be increasingly costly and (increasingly) more difficult to solve, and, on average, knowledge advances in small increments (Rescher 1978, 1980; Tainter 1988). Increasing investments in research produce declining marginal returns.

Some notable scholars have dealt with these matters. Walter Rostow once said that marginal productivity rises first and then falls in particular fields (1980). The great physicist Max Planck, in a statement that Rescher calls "Planck's Principle of Increasing Effort," observed that "...with each advance (of science), the difficulty of tasks increases" (Rescher 1980).

As easier issues are resolved, science inevitably moves to more complex research areas and larger, more costly organizations (Rescher 1980).

Rescher suggests that "As science progresses in any of its specialized branches, there is a marked increase in the overall cost of resources to make scientific discoveries of a given level of intrinsic significance..." (1978). Exponential growth in the size and cost of science is needed simply to maintain a constant rate of progress (Rescher 1980). Derek de Solla Price pointed out that in 1963 science was, even then, growing faster than the population or the economy and that, of all the scientists who had ever lived, 80 or 90% were alive at the time. he wrote (Price 1963). At the same time, those issues prompted Dael Wolfe to raise a question, publishing in *Science* an article titled "How Much Research for a Dollar?" (Wolf 1960).

Scientists rarely think about the benefit/cost ratio when investing in their research. Even if we value the productivity of our investments in science by some method, such as the publication of patents (figure 3), the productivity of certain types of research appears to be on the decline. Patents are a controversial indicator among those who study these issues (Machlup 1962; Schmookler 1966; Griliches 1984) and do not, by themselves, indicate cost recovery. Medicine is a field of applied science where payback can be more quickly determined. In the 52-year period shown in Figure 4, from 1930 to 1982, the productivity of the US healthcare system in improving life expectancy fell by nearly 60%.

The declining productivity of the US health system clearly shows the historical development in the realm of problem solving. Rescher (1980) notes: Once all the discoveries of a certain level of research technology have taken place, one must move to higher cost levels... In the natural sciences, we are engaged in an arms race: with every victory on nature, the difficulty increases to reach the new milestones that lie ahead.

Figure 3. Patent applications with respect to research expenditures, 1942-1958 (data from Machlup 1962).

The dwindling productivity of medicine is due to the fact that simple diseases and ailments were overcome first (the basic research that led to penicillin cost no more than \$20,000), so those that remain are more difficult and costly to resolve (Rescher 1978). And each time an increasingly costly disease is beaten, the increase in average life expectancy becomes smaller.

Implications of the examples

The Roman Empire, industrialism, and science are not only important on their own merits, but also because they exemplify: (1) how problem solving evolves along the path of increasing complexity, higher costs, and diminishing marginal returns (Tainter 1988), and (2) the different results of these processes. In the next section, I will discuss what these patterns imply for our efforts to deal with contemporary problems.

PROBLEM SOLVING, ENERGY AND SUSTAINABILITY

This historical discussion gives a perspective on what is practical and sustainable. A few years ago I described a dozen societies that had collapsed (Tainter 1988). In no case is it evident or even probable that these societies collapsed because their members or their leaders did not take concrete steps to solve their problems (Tainter 1988). The experience of the Roman Empire is again instructive in this regard. Most of the actions that the Roman government undertook in response to crises, such as devaluing the currency, raising taxes, expanding the army, and forced labor conscriptions, were practical solutions to immediate problems. It would have been unthinkable not to adopt such measures. Cumulatively, however, these steps further weakened the empire, as the main reserves (agricultural land and peasants) were depleted by taxes and conscription. Over time, the development of practical solutions led the Roman Empire first to diminishing returns and then to losses from complexity. What this implies is that focusing a problem-solving system, such as ecological economics, on the search for practical applications will not automatically increase its value to society, nor will it improve sustainability. The historical development of problem solving systems must be understood and taken into consideration.

Figure 4. US Health System Productivity 1930-1982 (data from Worthington 1975; from US Census Bureau 1983). Productivity index = (Life expectancy) / (National expenditures on health, as a percentage of GDP).

Most who study contemporary issues would certainly agree that solving environmental and economic problems requires knowledge and education. A large part of our response to current problems has been to increase the level of research on environmental issues, including global change. As our knowledge increases and practical solutions emerge, governments will implement those solutions and bureaucracies will see to it. New technologies will be developed. Each of those steps will appear as a practical solution to a specific problem. But cumulatively, those practical problem-solving steps will bring greater complexity, higher costs, and diminishing returns. Richard Norgaard has put the problem well: "Ensuring sustainability by raising targets...will require increased data collection, interpretation, planning, political decision-making, and bureaucratic control, by several orders of magnitude." (Norgaard 1994).

Donella Meadows and her colleagues have provided excellent examples of the economic limitations of current problem solving. To increase food production from 1951 to 1966 by 34%, for example, spending on tractors had to be increased by 63%, nitrogen fertilizers by 146%, and pesticides by 300%. Removing all organic waste from a sugar processing plant costs 100 times more than removing 30%. Reducing sulfur dioxide from the air in a US city by 9.6 times, or particulate matter by 3.1 times, raises the cost of pollution control 520 times (Meadows *et al.* 1972) All resolution of environmental problems faces limits of this type.

Bureaucratic regulation itself generates greater complexity and costs. By establishing regulations and taxes, those who are regulated or charged look for loopholes (where to escape) and legislators strive to close those loopholes. Thus, a spiral of discovery and closure of loopholes, of constantly increasing complexity, is established (Olson 1982). As soon as cost of government loses political support, the strategy becomes untenable. It is often suggested that benign environmental behavior should be achieved through tax incentives rather than regulation. Although this idea has some advantages, it does not address the problem of complexity and may not reduce total regulatory costs as much as expected. Those costs may simply be passed on to the tax authorities and to society at large.

It is not that research, education, regulation and new technologies are incapable of alleviating our problems. With enough investment maybe they can. The difficulty is that these investments will be expensive and may require a growing percentage of GDP. With dwindling returns problem solving, dealing with environmental issues in a conventional way means more resources will have to be devoted to science, engineering and government. In the absence of strong economic growth, this would require at least a temporary decline in living standards, as the population would have comparatively less to spend on food, shelter, clothing, medical care, transportation, and leisure.

To avoid the high cost of troubleshooting, it is frequently suggested that resources be used more efficiently and intelligently. Timothy Allen and Thomas Hoekstra, for example, have suggested that to manage the sustainability of ecosystems, those responsible should identify what is missing in natural regulatory processes and provide only that. The ecosystem would do the rest. Let the ecosystem (for example, solar energy) sustain the management effort and not the other way around. It's a smart suggestion. However, putting this into operation would require knowledge that we do not now possess. That means research is needed that is complex and expensive and requires the support of fossil fuels. Reducing the costs of complexity on the one hand leads to increasing them on the other.

Agricultural pest control illustrates this dilemma. As pesticide spraying became more expensive and less profitable, integrated pesticide management was developed. This system relies on biological knowledge to reduce the need for chemicals and employs monitoring of pest populations, biological controls, judicious application of chemicals, and careful selection of crop types and planting dates (Norgard 1994). It is a solution that requires both specialized research by scientists and careful supervision by farmers. Integrated pest management violates the principle of complexity aversion, which may partly explain why it is not used more widely.

These issues help clarify what constitutes a sustainable society. The fact that problem-solving systems appear to be evolving toward greater complexity, higher costs, and diminishing returns has significant implications for sustainability. Over time, systems that develop in this way either run out of funding, or cannot fix the problems, or collapse, or end up requiring large energy inputs. This has been the historical pattern in such cases as the Roman Empire, the Classic Maya of the lowlands, the Chacoan

society of the American Southwest, warfare in medieval and Renaissance Europe, and in some aspects of contemporary problem solving (that is, in any case that I have investigated in detail) (Tainter 1988, 1992, 1994b, 1995a). These historical patterns suggest that one of the characteristics of a sustainable society will be that it has a sustainable problem-solving system, with increasing or stable benefits, or with decreasing returns that can be financed with energy inputs that have a supply, a cost and guaranteed quality.

Industrialism illustrates this point. It generated its own problems of complexity and high cost. These included railways and canals to distribute coal and manufactured goods, the development of an economy based increasingly on money and wages, and the development of new technologies. Although such elements of complexity are often thought to facilitate growth, in reality they do so only when sustained by energy. Some of the technologies, such as the steam engine, showed diminishing returns early in their development (Wilkinson 1973; Giarini and Louberge 1978; Giarini 1984). What distinguished industrialism from all previous history of our species was its reliance on abundant, concentrated, high-quality energy (Hall *et al.* 1992).⁷ Supported by cheap fossil fuels, many of the consequences of industrialism did not really matter for a long time. Industrial societies could afford them. When energy costs are met easily and painlessly, the benefit/cost ratio of social investments can be virtually ignored (as is the case with contemporary industrial agriculture). Fossil fuels made industrialism and everything that flowed from it (such as science, transportation, medicine, employment, consumerism, high-tech warfare, and contemporary political organizations) a problem-solving system that was sustainable for several generations.

Energy has always been the basis of cultural complexity and always will be. If, it seems, our efforts to understand and resolve issues such as global change involve increasing political, technological, economic and scientific complexity, the availability of energy per capita will be a limiting factor. Increasing complexity by maintaining a static or dwindling energy supply would mean lower living standards around the world. In the absence of an obvious crisis, very few people would support it. Maintaining political support for our current and future investments in complexity therefore requires an increase in the effective supply of energy per capita - both through increasing the physical availability of energy, and through technical, political, or economic innovations that reduce energy costs of our standard of living. Of course, developing these innovations requires energy, which highlights the limitations of the relationship between energy and complexity.

⁷ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

CONCLUSIONS

This chapter on the past clarifies potential pathways to the future. A frequently discussed pathway is cultural and economic simplicity and lower energy costs. This could come by way of the "fall" that many fear - a true collapse within a generation or two, with much violence, famine and population loss. The alternative is the "soft landing" that many people hope will happen - a voluntary switch to solar energy and green fuels, energy conservation technologies and lower consumption in general. This is an alternative utopia that, as previously suggested, will only come if severe and prolonged privation in industrial nations makes it attractive and if economic growth and consumerism can be driven out of the ideological field.

The most likely option is a future of higher investments in problem solving, increased overall complexity, and higher energy usage. This option is driven by the material comfort it provides, hidden interests, the lack of alternatives and our conviction that it is good. If the path that humanity has followed in problem solving over the last 12,000 years is to continue, this is the path that we are likely to take in the near future.

Regardless of when our efforts to understand and solve current problems begin to deliver diminishing returns, one point should become clear. It is essential to know where we are in history (Tainter 1985a). Whether macroeconomic patterns unfold over generations or centuries, it is not possible to understand our current conditions unless we understand where we are in this process. We have the opportunity to become the first people in history to understand how a society's ability to solve problems changes. Knowing that this is possible and not acting accordingly would be a major failure in the practical application of ecological economics.

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GRADES

1. In certain publications of the physical sciences, which strive for a definition, as objective as possible, it is considered that the complexity of a system can be the length of a description of its regularities (Gell-Mann 1992, 1994). This is consistent with the

definition used here. A society with fewer parts, less differentiated parts, and fewer integrated or simpler systems can certainly be described more succinctly than a more complex society (Tainter 1995b).

2. Collapse is a rapid transformation to a lower degree of complexity, generally involving lower energy consumption (Tainter 1988).

3. This is part of the process responsible for the current separatist movements in the US.

4. [Not indicated in the text]. I have not considered so-called “green” alternatives in this analysis. There are two reasons why these seem impractical in the short term. First, industrial economies are closely tied to production systems and basic resources, including conventional energy. (Hall *et al.* 1992; Watt 1992). The main costs of this gigantic industrial conversion could be very high. Second, experience since 1973 indicates that mere abstract projections about long-term supplies of energy or other resources will not cause most members of industrial societies to change their consumption patterns. They will only change when the prices of energy and the goods and services that depend on it rise sharply over a long period of time. Convincing people that the world they have been used to has irrevocably changed takes a long time. Minor or episodic penalties only allow leaders to exploit popular discontent for personal gain. Economic growth has been mythologized as part of our ideology, making it particularly difficult to objectively discuss it in the public arena (Giarini and Louberge 1978).

5. Coal was not, of course, the only element that promoted industrialization. Other factors included dwindling supplies of wood fuel (Wilkinson 1973), changes in land use, and the availability of workers who could be employed in manufacturing.

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Presentation of “THE COLLAPSE OF COMPLEX SOCIETIES: SUMMARY AND IMPLICATIONS”

The following article is a translation and adaptation of the last chapter of the book *The Collapse of Complex Societies*, by Joseph Tainter, an American anthropologist and historian.

The theory that Tainter expounds in that book can be roughly summarized as follows:

Civilized (or complex, as Joseph Tainter calls them) societies tend to solve problems by increasing the complexity of the social system. This trend, at first, is effective and profitable to ensure the survival and development of societies when facing specific problems, but as time goes by, the increase in complexity itself generates new problems and conditions that demand an even greater investment in complexity. At some point, known as the point of diminishing returns, material limits to growth mean that investing in complexity brings fewer and fewer returns. This point implies that the society in question has become vulnerable to collapse, that is, to a reduction in its degree of complexity. So that a society that has reached the point of diminishing returns does not collapse, it has to find new sources of matter and energy that allow it to continue increasing its complexity without reducing the profitability of the process. When this is not possible, the degree of complexity of the society ends up being reduced, that is, it collapses.

The latter has happened many times in history throughout the world. Tainter, after reviewing various examples of historical collapse, concludes the text with an analysis of the state of modern civilization from the perspective of diminishing returns.

We believe that the rational and materialistic perspective of the author together with the amount of data and examples provided make the text worth being taken into account.

THE COLLAPSE OF COMPLEX SOCIETIES: SUMMARY AND IMPLICATIONS¹

By Joseph Tainter

Every time history repeats itself the price goes up.

Message on a billboard

Collapse is recurrent in human history; Its incidence is global and affects the spectrum of societies that goes from simple hunter-gatherers to great empires. Collapse is a matter of considerable importance to every member of a complex society, and seems to be of particular interest to many people today. Political decentralization has repercussions on the economy, art, literature and other cultural phenomena, but these are not its essence. The collapse is fundamentally a sudden and pronounced loss of the established level of sociopolitical complexity.

A complex society that has collapsed is suddenly smaller, simpler, less stratified, and less socially differentiated. Specialization decreases and there is less centralized control. The flow of information falls, people trade and interact less, and in general there is less coordination between individuals and groups. Correspondingly, the level of economic activity declines, while the arts and literature experience such a quantitative decline that a dark age often ensues. Population levels tend to drop, and for those who remain, the known world shrinks.

Complex societies, such as states, are not a discrete stage in cultural evolution. Each society represents a point along a continuum from least complex to most complex. Comparatively complex forms of human organization have only recently emerged and are an anomaly in history. When viewed against the larger picture of our history, complexity and layering are rarities, and when they do appear, they need to be constantly reinforced. Leaders, parties and governments need to continually establish and maintain legitimacy. This effort must have a real material base, which means that a certain degree of response is necessary with respect to the support population. Maintaining legitimacy or investing in coercion requires constant resource mobilization. This is a relentless cost that any complex society must bear.

Two of the main approaches to understanding the origin of the state are those of the conflict and integration schools. The first sees society as a stage for class conflict. The governing institutions of the state, from this perspective, arose from economic stratification, from the need to protect the interests of the wealthy classes. Integration theory suggests, by contrast, that governing institutions (and other elements of complexity)

¹ Translation and adaptation of the final chapter "Summary and implications" of *The Collapse of Complex Societies*, by Joseph A. Tainter (New York, Cambridge University Press, 1988), by P., M. and UR Translators' note.

arose from the needs of the whole society, in situations where it was necessary to centralize, coordinate, and direct distinct subgroups. Complexity, from this perspective, emerged as a process of adaptation.

Both approaches have strengths and weaknesses, and ultimately a synthesis of the two seems desirable. The integration theory has more capacity to explain the distribution of what is necessary to live, the conflict theory to explain the surpluses. There are definitely beneficial integrative advantages in the concentration of power and authority but, once established, the political sphere becomes an increasingly powerful influence. In both perspectives, however, the state is a problem-solving organization, emerging because of changing circumstances (uneven economic success in the conflict perspective; management of society-wide tensions in the conflict theory). integration). In both approaches, legitimacy and the mobilization of resources that it requires are constant needs.

Although the collapse is a poorly understood process, it has not been for a lack of trying. Collapse theorists have taken to heart the Maoist maxim of letting a hundred schools of thought compete. While there is an almost incomprehensible diversity of opinion regarding the collapse, it seems to narrow down to a limited number of issues. These themes suffer from several logical errors, so none is suitable by itself. Mystical explanations seem to be the worst in this regard, having virtually no scientific merit whatsoever. Economic explanations are logically superior. They identify the characteristics of societies that make them susceptible to collapse, specify the control mechanisms, and indicate causal chains between the control mechanism and the observed result. But the existing economic explanations do not offer a general approach that allows the understanding of the collapse as a global issue. Except for the mystical theme, none of the existing approaches is necessarily wrong. They are, as currently formulated, simply incomplete.

Four concepts lead to an understanding of collapse, of which the first three serve as the basis for the fourth. These are:

1. human societies are problem-solving organizations
2. sociopolitical systems require energy for their maintenance
3. Greater complexity leads to higher costs per capita
4. investment in sociopolitical complexity as a response to problem solving often reaches a point of diminishing marginal returns²

This process has been illustrated in recent history in such areas as agriculture and resource production, information processing, sociopolitical specialization and control, and economic productivity in general. In each of these areas it has been shown that, with ever-increasing expenditures, industrial societies are obtaining diminishing marginal returns. The reasons for this are summarized below.

² In economic theory, it is called *marginal yield (or product)*, to the change in the amount of total product that results from altering the variable production factor by one unit, keeping all the others fixed factors of production. Marginal returns can be *increasing* or *decreasing*.

To the extent that information allows, rationally acting human populations first make use of those sources of nutrition, energy, and raw materials that are easiest to obtain, extract, process, and distribute. When these resources are no longer sufficient, exploitation is transferred to others that are more difficult to obtain, extract, process and distribute, despite not producing higher yields.

The costs of information processing tend to increase over time, since a more complex society requires more and more highly qualified and specialized personnel, who must be trained at a higher cost. Because the benefits of specialized training are always attributable in part to the generalized education that must precede it, more technical training will automatically produce a diminishing marginal return. Research and development moves from generalized knowledge that is widely applicable and obtained at low cost, to specialized topics that are of lesser use, are more difficult to solve, and are only solved at great cost. Modern medicine is a clear example of this problem.

Sociopolitical organizations constantly encounter problems that require greater investment merely to preserve the *status quo*. This investment takes the form

Curve of marginal return on investment in complexity. The point (C1,B1) is the point from which the marginal returns begin to be diminishing. such as increased size and specialization of bureaucracies, cumulative organizational solutions, rising costs of activities of legitimation and increased costs of internal control and external defense. All of this must be sustained by raising higher taxes from the support population, often without increasing the benefits to the support population. As the number and cost of organizational investments increase, the proportion of a society's budget available to be invested in future economic growth must decrease.

Thus, although initial investments in increasing the complexity of a society may be a rational solution to perceived needs, this happy state of affairs cannot last. As less expensive extractive, economic, information processing, and organizational solutions are progressively exhausted, any further need for increased complexity must be met by more expensive responses. As the cost of organizational solutions grows, the point is reached where continuing to invest in complexity does not pay off and marginal returns begin to decline. Earnings per unit of investment begin to fall. Larger and larger increments of investment produce smaller and smaller increases in return.

A society that has reached this point cannot simply rest on its laurels, that is, try to maintain the marginal returns of the current situation without further deterioration. Complexity is a strategy for solving problems. The problems that the universe can present to any society are, for practical purposes, infinite in number and endless in variety. As tensions necessarily arise, new organizational and economic solutions must be developed, usually with increasing costs and diminishing marginal returns. Consequently the marginal return on investment in complexity deteriorates, at first gradually, then rapidly. At this point, a complex society reaches the stage where it becomes increasingly vulnerable to collapse.

Two general factors can make such a society susceptible to collapse. First, as the marginal return on its investment in complexity declines, a society invests more and

more heavily in a strategy that pays off proportionately less. The surplus of the productive capacity and the accumulated surplus can be assigned to the operating needs of the moment. When great bouts of stress arise (great adversity) there is little or no reserve with which they can be counteracted. Stress hits should be managed outside of the operating budget at the time. This is often ineffective. Where not, society may be economically weakened and more vulnerable to the next crisis .

Once a complex society enters the phase of diminishing marginal returns, collapse becomes a mathematical possibility, with little more than a long enough time required for an insurmountable calamity to strike. So if Rome had not been overthrown by the Germanic tribes, it would later have been overthrown by the Arabs, the Mongols, or the Turks. A calamity that would have been disastrous for a long-established society might have been surmountable when the marginal return on investment in complexity was still growing. Rome, again an excellent example, was thus able to withstand major military disasters during Hannibal's war (late 3rd century BC), but was severely weakened by losses that were comparatively minor (relative to the size and wealth of Rome in general). both eras) at the Battle of Adrianople in AD 378 Similarly, the catastrophic barbarian invasions of the first decade of the fifth century were, in fact, smaller than those that were defeated by Claudius and Marcus Aurelius in the late third century (Dill 1899:299).

Second, diminishing marginal returns make complexity a less attractive strategy in general, so that some sectors of society perceive increasing advantages in a policy of separation or disintegration. When the marginal cost³ of investing in complexity becomes conspicuously too high, various sectors increase passive or active resistance, or attempt to split openly. The Bagaudae insurrections in late Roman Gaul are a good example.

At some point along the declining portion of a marginal returns curve, a society reaches a state where the benefits available for a given level of investment are no greater than those available for a lower level. At this point, complexity is undoubtedly unfavorable and society is at serious risk of collapsing due to decomposition or external threat.

The evaluation of this approach against the three best-known cases of collapse (the Western Roman Empire, the Maya of the Southern Lowlands, and the Chacoan culture) yields positive results. The establishment of the Roman empire produced an extraordinary return on investment as the conquerors appropriated the accumulated surpluses of the Mediterranean and adjacent lands. However, as the spoils of new conquests ceased, Rome had to assume administrative and military costs that lasted for centuries. As the marginal return on investment to maintain the empire declined, large bouts of stress appeared that could barely be contained within the annual impe-

³ The *marginal cost*, in economic theory, is the change in the total cost that results from an increase of one unit in the quantity produced. It has a close relationship with marginal return: as marginal returns decrease, marginal cost increases. *N. of the t.*

rial budget. The Roman Empire became attractive to barbarian invasions merely by existing. Managing bouts of stress required such heavy taxation and economic embezzlement that the productive capacity of the supporting population deteriorated. The weakening of the support base led to more barbaric successes, so very large investments in complexity yielded little more than the benefits of collapse. In the late empire the marginal returns to investment in complexity were so low that barbarian kingdoms began to seem preferable. In an economic sense they were, as the Germanic kingdoms after Roman rule successfully dealt with bouts of stress of the kind that the late empire had found overwhelming, and did so at less cost.

The Maya of the Southern Lowlands were a people that suffered demographic pressure and territorial constriction. The demands of managing the intensification of agriculture, the organization of looting and defense, the maintenance of hierarchy, and monumental constructions imposed on the Maya a costly system that did not produce a proportional increase in per capita subsistence security. . The health and nutritional status of the population was poor and, most likely, due in part to the increasing cost of sustaining complexity, declined throughout the Classic period. The rise in social costs of the Terminal Classic period came at a time of deteriorating conditions, so that the marginal returns to investment in complexity left the Maya ripe for collapse.

In what is now the American Southwest, the people of the San Juan River Basin invested in hierarchy and complexity to reduce (through centralized management) the cost of a regional energy capping system. For a time the marginal return on this investment was favorable, but as more communities were added, the diversity and effectiveness of the economic system declined. This weakening coincided with a large construction program, so as the returns on investment in complexity fell, the costs of that investment rose.

For these three cases, then, focusing on the curve of the marginal returns to complexity investments has clarified the process of collapse and allowed us to see why each society was vulnerable.

Five main issues remain to be addressed. These are: (1) additional observations on collapse and on the nature of the diminishing productivity of complexity; (2) application and extension of the concept; (3) implications for a deeper study of some of the cases discussed⁴; (4) subsuming other explanatory issues under the principle of dimin-

⁴ The cases to which the author refers (discussed in chapter 1 of the book from which the present text has been extracted) are: the western Zhou empire of ancient China, the Indus Valley civilization, Mesopotamia, the ancient Kingdom of Egypt, the Hittite empire, the Minoan civilization, the Mycenaean civilization, the western Roman empire, the Olmecs, the Classic Maya of the Lowlands, Teotihuacan, Tula, Monte Alban and other pre-Columbian states of the Highlands of Mesoamerica, Casas Grandes of the area now occupied by northern Mexico, the Chacoans of the region that is now New Mexico, the Hohokam of Arizona, the Hopewell complex and the Mississippians of the forests of the eastern United States, the Huari empires and Tiahuanaco from Peru, the Kachin from Burma and the Ik from Uganda. *N. of the t.*

ishing marginal returns; and (5) implications for today and for the future of industrial societies. The definition of collapse will be completed here.

The collapse and diminishing productivity of complexity

In this section we come to one of the main implications of the study. Most of the authors whose works have been taken into account seem to approve of complex civilizations and societies. They see complexity as a desirable, even commendable, state of human affairs. For them, civilization is the highest achievement of human society, much preferable to simpler and less differentiated forms of organization. Clearly, appreciation for the artistic, literary, and scientific achievements of civilization, as well as the industrial world's view of itself as the culmination of human history, has much to do with it. Toynbee is perhaps the most extreme case in this regard, but he is by no means an outlier. Spengler, with his aversion to civilization and its aftermath, represents a minority view; just like Rappoport.

With such an emphasis on civilized society being desirable, it is almost a necessity that collapse be seen as a catastrophe. The completion of the artistic and literary creations of civilization and the umbrella of services and protection that the administration provides, is seen as a fearsome event, truly a lost paradise. The idea that the collapse is a catastrophe is widespread, not only among the population, but also among the academic professionals who study it. Archeology is as clearly implicated in this as any other field. As a profession we have tended disproportionately to investigate urban and administrative centers, where the most abundant archaeological remains are normally found. When these centers are abandoned or downsized in collapse, their loss is catastrophic for our databases and museum collections, and even for our ability to secure financial support. (The dark ages are rarely attractive to philanthropists or the institutions they fund.) Archaeologists, however, are not the only ones to make this mistake. Scholars of classical antiquity and historians who rely on literary sources are also prejudiced against the dark ages, because at such times their data bases largely disappear.

A less biased approach must be to study not only the elites and their creations, but also to obtain information on the productive sectors of complex societies that continue, if in small numbers, after the collapse. Archaeology, of course, has great potential to offer such information.

Complex societies, it must be repeated, are recent in human history. The collapse, therefore, is not a collapse into primordial chaos, but a return to the normal human condition of lesser complexity. The notion that collapse is invariably a catastrophe is further contradicted by current theory. To the extent that collapse is due to diminishing marginal returns to investment in complexity, it is an *economizing* process. It occurs when it becomes necessary to return to a more favorable level the marginal return on organizational investments. For a population that is receiving little gain relative to the cost of maintaining complexity, the loss of that complexity brings economic and perhaps managerial gain as well. Again, one is reminded of the support sometimes given by the population of the late Roman empire to the barbarian invaders and the

latter's success in blocking further invasions of Western Europe. The attitudes of the late Mayan and Chacoan populations toward their administrators are unknown, but can easily be imagined.

Societies collapse when stress demands some organizational change. In a situation where the marginal utility of even greater complexity would be too low, collapsing is an economic alternative. Thus, the Chacoans did not face the last drought as the cost of doing so would have been too high in relation to the benefits. Although the end of the Chacoan system meant the end of some benefits (as happens with the end of any complex system), it also brought an increase in the marginal returns of the organization. The Maya, similarly, seem to have reached the point where evolving into larger units of government would have brought little benefit for much effort. Since the status quo was so pernicious, collapse was the most logical fit.

The weakness of one of the explanatory themes may now be fully exposed: the "failure to adapt" model. Proponents of this perspective argue, one way or another, that complex societies come to an end because they fail to respond to changing circumstances. This idea is clearly missed: *under a situation of diminishing marginal returns, collapse may be the most appropriate response*. These societies have not failed to adapt. In an economic sense they have adapted well—perhaps not as those who value civilization would like, but they have adapted well to the circumstances.

What might be a catastrophe for administrators (and subsequent observers) need not be for the majority of the population (as explained, for example, in Pfeiffer [1977: 469-71]). The collapse of administrative hierarchies may be a clear disaster only for those members of a society who have neither the opportunity nor the ability to produce primary food sources. For those less specialized, it is often attractive to sever the ties that bind local groups to a regional entity. Collapse then is not intrinsically a catastrophe. It is a rational and economizing process that may well benefit a large part of the population.

An unclear aspect of this perspective is the large population loss that sometimes accompanies collapse. The Mayans are a classic example of this. How could the Mayan collapse have been advantageous if it resulted in a huge population loss? In fact, as shown in the work of Sidrys and Berger (1979), the relationship between the Maya collapse and population loss is not clear. It is not certain that these phenomena were contemporaneous (especially since the collapse took decades to bring down all the centers), nor is it even certain that the loss of population in the Lowlands does not reflect emigration to peripheral areas. With these questions unresolved, discussions of cause and effect are premature. In any case, nothing said in the preceding paragraphs implies that human actions always achieve, in the long run, a desirable result. Even if the Mayan collapse turned out to be detrimental to the survival of large parts of the population in the long run, this does not necessarily mean that in the short run the collapse was not an economizing process.

Indeed, there are indications that actual population leveling or decline may often precede collapse, even by several centuries. Such patterns have been analyzed for both

the Roman and Mayan cases. A recent study suggests a similar trend in the large Mississippian hub of Cahokia. Apparently, the population in this region had peaked around AD 1150 and declined until its final collapse 250 years later (Milner 1986).

Should every complex society go through this process? Do investments in complexity *always* reach the point where the marginal return diminishes? Modern economic research would not offer a clear answer to this question. The argument put forward here merely asserts that where this process operates and continues unchecked, society will become vulnerable to collapse. Indeed, it would seem that to the extent that less expensive organizational solutions are preferred over more expensive ones, the need to add organizational functions should regularly produce diminishing marginal returns. However, in societies with the necessary capital, technological potential, and economic and demographic incentives, gaining new energy input (through empire building or exploiting a new energy source) or economic development may for a time to reverse a declining marginal curve, or at least provide the wealth to finance it. Renfrew (1972: 36-7) says precisely this in relation to the evolution of complexity in Greece and the Aegean.

Admittedly, this approach removes much of its mystery from the collapse and identifies it as a mundane economic issue. It is, as Finley would say, "...a way of looking at the great cataclysms of history that is neither dramatic nor romantic. One couldn't make a movie out of it" (1968: 161).

Further implications of diminishing marginal returns

Looking at this work, it may seem that archeology is campaigning to displace economics from its position as "dark science". It is clear that the marginal product curve is nothing new. It was developed to describe the changing cost/benefit curves in resource extraction, as well as the entry/exit ratios in the industrial sector. The idea of diminishing returns in economic activity is at least as old as the classical economists of the 19th century: Thomas Malthus, David Ricardo, and John Stuart Mill (Barnett and Morse 1963: 2). It applies to subsistence agriculture, mineral and energy production, information processing, and many features of sociopolitical organization. Wittfogel (1955, 1957) applied the concept of "administrative returns" to the expansion of government to encompass economic affairs in "Oriental despotisms." Lattimore (1940) explained Chinese dynastic cycles in terms of increasing and decreasing returns. It seems that Kroeber's (1957) remarks about the "culmination" of artistic styles may refer to a situation where innovation within a style becomes increasingly difficult to achieve, leading to repetition and reorganization of previous works and, finally, to a new style where innovation is more easily achieved. The phenomenon is by no means limited to the human species. Predatory animals appear to follow the principle of marginal returns in their choice of environmental zones in which to forage (Charnov 1976; Krebs 1978: 45-8).

A familiar explanation for the collapse - peasant revolt - deserves comment here. It seems insufficient to propose that the peasants rebel because of an unfair level of taxation, since there can be cases (eg the Mayans) where the peasantry endured

exacting demands for centuries. What seems most likely to be a relevant explanation is the marginal return on fiscal support, and more particularly, any pattern of significant decline in this return. Peasant political action would be remarkably more intelligible in this light. In modern peasant revolts, of course, other factors are involved, such as an intellectual elite adhering to an international ideology that is capable of making the peasantry aware of its marginalized status. In any case, the mere tax level is an insufficient explanation for peasant action in this area. Some idea of cost/benefit ratios is required.

Gordon Childe made some pertinent observations on the issue:

...the instability of these [early] empires reveals a contradiction within them; the persistence with which the subject people rebelled is a measure of their gratitude for the benefits [of the empires], and perhaps also of the value of the latter. Presumably the benefits were far outweighed by the drawbacks. In fact, an empire like Sargon's probably destroyed more wealth directly than it created indirectly (1951: 185).

Among his many astute observations, Polybius suggested that Rome's triumph over Carthage was due to the fact that when they came into conflict, the former was increasing in power and the latter was losing it. In somewhat similar style, Elman Service applied his "Law of Evolutionary Potential" to suggest that old, established states fossilize, become incapable of adopting innovations, and are therefore overtaken by new peripheral peoples, even if these are minor. . It would be worthwhile for historians to investigate the marginal return on investment in organization that such competitors experience. An old, established state is likely investing in so many organizational structures that its marginal return on those investments has begun to decline, leaving fewer and fewer reserves with which to contain episodes of stress. It is then understandable that such a nation is outperformed by less complex peoples, who invest in little more than war and earn favorable returns on that investment. Polybius' perspective on Rome and Carthage, thus viewed, can be extended to Rome's conquests in the eastern Mediterranean over many older, established states and confederations.

The question that logically follows is why the pattern seen in the final Roman story has not been repeated later. Why has there been no sociopolitical collapse in Europe since the fall of the Western empire? This question can only be fully answered in a large treatise, but it is helpful at this point to outline some factors worth investigating.

There are significant differences between the evolutionary histories of societies that have emerged as isolated, dominant states and those that have developed as interacting ensembles of what Renfrew (1982: 286-9) has called "comparable governmental systems⁵" and B. Price has qualified as "clusters" (1977). Comparable governmental systems are those, such as the Mycenaean states, the last small city-states of the Aegean and Cyclades, or the Maya centers of the Lowlands, which interact on a roughly equiv-

⁵ *Peer polities* in the original. In English, *peer* has the same meaning as the Spanish word *par* in the sense of "of equal status". In this sense, the author uses the word, but since understanding the concept is difficult when translating it literally as "peer government systems", it was decided to translate *peer polities* as "comparable government systems". *N. of the t.*

alent level. As Renfrew and Price make clear, the evolution of such groupings of comparable governmental systems is not conditioned by any dominant neighbor but more usually by their own mutual interaction, which can include both exchange and conflict.

In competitive, or potentially competitive, situations between comparable government systems, the option to collapse and descend to a lower level of complexity is an invitation to be dominated by some other member of the group. If this dominance is to be avoided, investment in organizational complexity must be kept at a level similar to that of competitors, *even if marginal returns become unfavourable*⁶. Complexity must be maintained at any cost. Such a situation seems to have characterized the Maya, whose individual states developed into comparable governmental systems over centuries and then collapsed within a few decades of each other (Sabloff 1986).

The European states after Rome experienced an analogous situation, especially since the demise of the Carolingian empire. The European history of the last 1,500 years is basically a history of comparable governmental systems interacting and competing, endlessly maneuvering for advantage and struggling to expand at the expense of the neighbor or prevent the latter from doing the same. Collapse is simply not possible in such a situation, unless all members of the cluster collapse at once. Excepting the latter, any failure of a particular governmental system will simply lead to the expansion of another, thus not resulting in a loss of complexity. The costs of such a competitive system, such as that existing among the Maya, had to be borne by each government system, no matter how unfavorable the marginal return. As Renfrew points out for the Cyclades, "*A given state is legitimated in the eyes of its citizens by the existence of other states that evidently function along similar lines.*" (1982: 289 [italics in the original]).

Peasant political action in such a situation is logically more directed towards *reform* than disintegration. Where the failure of one government would simply mean for the peasants domination by some other equivalent regime, resignation and apathy make no sense. The political trajectory followed by European peasants and other discontented classes, under these restrictions, was to increase participation, enlarge their share in the decision-making process, and thereby secure a more favorable return on organizational investment. One point worth noting for Marxists in this regard is that class conflict led to political evolution only when the least costly option - collapse - was ruled out.

Although this brief analysis cannot fully explain these elements of European political history, the points made here deserve further investigation. It is most likely no coincidence that participatory forms of government arose, both in the ancient world (Greece, republican Rome) and in the recent world, under circumstances of competition between comparable governmental systems.

China's Warring States period, after the collapse of the Western Zhou dynasty, offers an interesting contrast. Here a situation of competition between comparable governmental systems (the Warring States), prior to unification at the hands of the

⁶ Italics in the original. *N. of the t.*

Ch'in, led to the development (by such thinkers as Confucius and Mo Tzu) of an ideology of good governance and protection. from town. Good rulers were thought to receive the Mandate of Heaven and would continue to enjoy this Mandate as long as they ruled well. The cessation of good government, or a series of catastrophes, were signs that a dynasty had lost the Mandate of Heaven. Soon a new dynasty would emerge that would claim the Mandate had been deeded to it (Creel 1953; Fairbank *et al.* 1973: 70-3). In ancient China, then, competition between comparable governmental systems evolved with an ideology of protecting the people, rather than leading to participatory government. Perhaps participatory government was simply not possible in ancient societies that were much larger, demographically and territorially, than the Greek city-states.

At this point we come to the first step in understanding the difference between societies that are slowly disintegrating and those that are rapidly collapsing. The Byzantine and Ottoman empires are classic examples of the former. Both gradually lost power and territory to their competitors. There was no collapse in this process - no sudden loss of complexity - because each episode of weakness on the part of these empires was simply met with expansion by their neighbors. Herein lies an important principle of collapse (and the last part of its definition). *Collapse occurs, and can only occur, in a power vacuum.* Collapse is only possible where there is no competitor strong enough to fill the political vacuum of disintegration. Where such a competitor exists there can be no collapse, since the competitor will expand territorially to manage the population left without leadership. Collapse is not the same as regime change. Where comparable government systems interact, collapse will affect them all equally, if and when it happens, as long as no external competitor is powerful enough to absorb them all.

Here, then, is the reason why the Mayan and Mycenaean centers collapsed simultaneously. No mysterious invader captured each of these governments in an unlikely series of fabulous victories. As the small Maya and Mycenaean states respectively became trapped in competitive spirals, each had to make ever larger investments in military strength and organizational complexity. As the returns on these investments declined, no government had the option of simply withdrawing from the spiral, as this would have led to a takeover by a neighbor. For such groupings of comparable governmental systems the collapse must be essentially simultaneous, as they together reach the point of economic exhaustion. Since in both cases no external dominant power (in the Mesoamerican Highlands or in the eastern Mediterranean) was close enough and strong enough to take advantage of this exhaustion, the collapse proceeded without external interference and lasted for centuries. (Later Greek city-states, by contrast, found themselves pitted against powerful neighbors who would take advantage of the political vacuum and therefore lacked the option of collapse.)

Here too is the reason why the Eastern Roman Empire could not collapse as the Western one did. The disintegration of the Byzantine state would simply have resulted in the expansion of its peer: the Sassanid empire (since, throughout its history, Byzantine weakness always led to the expansion of its rivals). There was no chance in the

eastern Mediterranean for a descent to a lower complexity equivalent to what happened in western Europe in the 5th century AD

So the occurrence of diminishing returns does not necessarily always lead to collapse: it will only do so where there is a power vacuum. In other cases it is more likely to be a source of political and military weakness, leading to slow disintegration and/or regime change. Lewis's (1958) observations on the decline of the Ottoman Empire, and those of R. McC. Adams (1978, 1981)⁷ on the replacement of the Sasanian regime by the Islamic one in Persia, illustrate this process. Toynbee's explanation of the role of the Romano-Bulgar war (AD 977-1019) in the Byzantine defeat at the Battle of Manzikert (1071) clearly shows that the Byzantine conquest of the Bulgars was achieved at great cost, due to poor performance, and weakened the Byzantine state (Toynbee 1962 (IV): 3712, 392, 398-402).

Suggestions for subsequent applications

Is a pattern of diminishing marginal returns the only reason for the collapse? Don't complex societies collapse for any other reason? Since it is not true that all cases of collapse have occurred yet, such questions cannot be settled definitively. Nuclear war, for example, is probably capable of causing collapse and does not fall into the category of marginal returns. At this point it can be said that no other existing theory can explain the phenomenon by itself and that the main examples of collapse are clarified in a good way by the present theory. The marginal return on investment in complexity is by far the best explanation for the collapse. At this point the discussion will focus on some cases of collapse that are not as well known as those discussed previously but for which there are now indications that diminishing marginal returns may have been involved. The purpose of this analysis is to suggest directions for future research. Undiscussed cases are left out because the available data are too scant for this purpose, not because some other explanation fits them better.

China Zhou. The rising cost of securing feudal officials' loyalty appears to have coincided with a rise in barbarian raiding. Thus there was a pattern of increasing costs in integrating and containing stress accesses, imposed on a situation where the returns to such costs may not have increased at all. Chinese dynasties seem to have suffered as a rule, from their founding to their demise, a deterioration in cost/benefit ratios.

Old Babylonian period. Despite the loss of dependencies during the reign of Samsuiluna, the crown nonetheless tried to maintain the previously established level of administration. Marginal returns axiomatically decrease in an attempt to govern a smaller land area and population with an administration designed for a larger territory.

⁷ No work by McC appears in the bibliography. Adams whose year of publication is "1981". It must, therefore, be an error of the author. Probably the correct numbers would be "1974, 1978", since they are the years of publication of the two works of McC. Adams that appear in the bibliography. *N. of the t.*

Third dynasty of the Ur/Sassanid period. Like R. McC. As Adams (1981)⁸ has described, these were periods in Mesopotamian history when maximizing regimes involved attempting to increase production through expansion onto marginal lands and intensive irrigation. This was done despite diminishing returns relative to costs, as the purpose was to secure every last possible fraction of production.

Ancient Empire of Egypt. A coincidence of several factors-increasing feudal independence, declining power of the king, increasing establishment of tax-exempt funerary investments, increased monumental construction during the Sixth Dynasty, and possible unreliability of the Nile-may have combined to produce a central administration that was increasingly more expensive while becoming less rich and powerful. The possibility of a failure of results (Easton 1965b: 230), given the king's inability to secure favorable Nile floods, would have contributed to the perception of diminishing marginal returns.

Harappa. It is not known whether the entire Harappan territory was politically unified. If it was not, then it is possible that the competitive relationships between Harappan governmental systems were a cause of diminishing marginal returns. Current research suggests that there were indeed several independent Harappan states (Possehl 1982).

Hittites. The policy of expansion that led to the establishment of the Hittite empire achieved success only after generations of struggle. The cost of this expansion may have made the Hittites vulnerable to the Kaska tribes and other less sophisticated peoples, who seem to have been involved in bringing down the empire.

Mycenaeans. As previously suggested, it is possible that the Mycenaeans, a grouping of comparable governmental systems, were involved in the same kind of competitive spiral that characterized other groups of comparable governmental systems - the late Greek city-states, the early Italian city-states and medieval, post-Roman Europe, the Warring States in China and the Mayans. As among the Maya, the rising costs of such a system, lacking any real benefit at the local level, would have caused diminishing marginal returns. Unlike China, where large territories and vast populations offset the costs of conquest and unification, any Mycenaean governmental system would yield little real return in competition. The result was probably constant investment in defense, military administration, and petty warfare, with any particular government system rarely getting a significant return on that investment.

Maurya Empire. This empire was established in northern India in the fourth century BC, in response to the conquests of Alexander [the Great]. By 272 BC it included almost all of the Indian subcontinent. However, it lasted less than a century and by 180 BC it was over. Subsequent empires never achieved the same scale. The dissolution began after Ashoka's death (232 BC) and one authority cites economic pressures. Vast tax revenues were necessary to maintain the army, pay officers' salaries, and settle the newly reclaimed lands. The Mauryans paid for this, in the late empire, by devalu-

⁸ *Idem. N. of the t.*

ing their currency (Thapar 1966: 70-91). This strategy is reminiscent of the Roman and Ottoman empires, both of which devalued their currency to pay for diminishing marginal returns.

Monte Alban. Blanton (1978, 1983) argues that the population of the Valley of Oaxaca ceased to support the Monte Albán hierarchy when it became ineffective in handling disputes and no longer needed as a defense against Teotihuacan. If so, the people of Oaxaca acted in an expected way when they perceived an insufficient return on their investment in complexity.

Hohokam. As described by D. Adams (1983: 37), Fred Plog and Charles Merbs recently excavated 36 Hohokam graves dating to the fourteenth century, not long before the collapse of that society. A significant amount of malnutrition was evident. Admittedly, this is a rare occurrence, but it does suggest that, as far as Hohokam are concerned, it might be worth investigating the existence of diminishing returns to the population from investment in complexity. Jill Neitzel has recently proposed that peripheral communities withdrew from the Hohokam system when the costs of participation exceeded the benefits (1984).

Huari. The Huari appear to have invested in a major cultural transformation of the lands under their control. This imposed economic, social and cultural changes. Large urban centers that included Huari architectural complexes were established in each valley. Ceramic styles were transformed. Goods and information were exchanged throughout the central Andes at unprecedented levels. It has been suggested that urbanism and militarism, state food distribution, the Andean road system, and the spread of the Quechua language began with the Huari empire. The Huari may therefore have initiated investment in these transformations, so that the later Incas merely had to reset the pattern for higher returns. For the Huari, the costs of implementing the imperial mandate may have been excessively high compared to the benefits.

Less complex societies. Sahlins (1963, 1968) and Leach (1954) have argued that, in simpler societies, investment in political expansion, with insufficient returns at the local level, breeds disaffection and collapse. Turnbull (1978) has explained its collapse as the abandonment of a level of complexity, even a minimal one, at which the investment could not produce any return. Hunters and gatherers, as is well known, collapse into minimal subsistence units (families) when social or resource stress makes large and complex food collections impossible.

Diminishing marginal returns, in general, can arise from any of the following conditions:

1. steady profits, rising costs
2. profits on the rise, costs growing even faster
3. diminishing profits, constant costs
4. Declining profits, rising costs

In undertaking the study of the collapse of any complex society, these conditions should be sought.

Diminishing Marginal Returns and Other Collapse Theories

The extent to which a global theory is illuminating or trivial depends, in part, on its ability to clarify matters that were previously unclear, on its flexibility in application, and on its ability to include within itself less general explanations. The diminishing marginal returns perspective has certainly clarified the collapse process and has shown to have a high degree of flexibility when it comes to being applied: three main and very different cases can be understood by means of it and, in this text, it will be explained. It has shown that several more collapses are, with the present information, potentially cleared up.

Being a very general principle, the application of this conceptual framework to specific cases cannot be automatic or mechanical. Every society that has collapsed has done so under a set of circumstances that were at least partially unique. The application of a general principle to such diversity requires different considerations in each case, including a sensitivity to the peculiar circumstances of local histories.

The principle of diminishing marginal returns has the logical capacity to incorporate other explanatory themes. An exception to this may be the mystical theme, which is difficult to incorporate into any scientific theory. Even so, some of the individual approaches to the mystical theme may turn out to be subsumable in diminishing marginal returns, as will be shown.

Resource depletion. The essence of depletion arguments is the gradual or rapid loss of at least part of a needed resource base, whether due to agricultural mismanagement, environmental fluctuations, or loss of trade networks. The major weaknesses of the approach are: why are measures not taken to stop the approaching weakness? And why does resource stress lead to collapse in some cases and economic intensification in others? Here the cost of further economic intensification envisaged must be weighed against the marginal benefits to be gained. If the marginal utility of further economic development is too low and/or if a society is already economically weakened by low marginal returns, collapse under such circumstances would be understandable. The collapse is not understandable, under resource stress, without reference to the characteristics of the society, more specifically to its position on a curve of marginal returns. A society that is already experiencing diminishing marginal returns may not be able to afford the economic development that is often a response to resource stress.

New Resources. The most general exposition of this theme has been offered by Harner (1970), who argues that new resources can alleviate scarcity and inequality, ending the need for hierarchy and complexity. This can be squarely subsumed under diminishing marginal returns: when a system of hierarchy and complexity is no longer needed, continuing to support it would yield diminishing returns and thus is likely to be abandoned.

Catastrophes. Catastrophe theories suffer from the same flaw as resource depletion arguments. Why would a society succumb if complex social systems are designed to cope with catastrophes and routinely do so? If any society has ever succumbed to a particular catastrophe, it must have been a disaster of truly colossal magnitude. In

any other case, the inability of a society to recover from a shock must be attributable to economic weakness, most likely resulting from diminishing marginal returns.

Insufficient reaction to circumstances. The “failure to adapt” model is based on a value judgment: that complex societies are preferable to simple ones, so their disappearance must indicate an insufficient reaction. This model ignores the possibility that, due to diminishing marginal returns, the crash might be an economical and very appropriate adjustment. Earlier in this text it has been shown that a main theory within this theme, Service’s “Law of Evolutionary Potential”, is subsumable in the principle of diminishing marginal returns. Conrad and Demarest’s (1984) study shows how the Aztec and Inca empires reached the point of diminishing returns for expansion and declined accordingly. Other theories grouped under this theme may not be linked to the collapse.

Other complex societies. Blanton’s argument that Monte Albán collapsed when it was no longer necessary for some tasks (detering Teotihuacan) or efficient at others (resolving conflicts) is fully compatible with the principle of marginal returns. Monte Albán collapsed, in other words, when the performance it could offer became too low relative to maintenance costs. Concerning competition between government systems, John Hicks once suggested that “...when the ability to expand is lost, so too can the ability to recover from disasters” (1969: 59). The ability to expand can be lost due to economic weakness, or when the cost of expansion becomes too high relative to the benefits. The latter will occur when one complex society impacts another (eg, Rome and Persia) and the marginal returns to conquest and administration are too low.

Intruders. The explanation of the scenario constituted by tribal peoples overthrowing great empires represents a great challenge. What features of the less complex society and/or what features of the more complex could lead to such circumstances? Service, as noted, ascribed this to his Law of Evolutionary Potential, which as noted can be subsumed under the principle of diminishing marginal returns. As was said regarding the ideas of Polibius and Service, a more powerful state might not prevail against a weaker one if the latter is moving up a marginal returns curve and the former is moving down it. A complex society that is investing heavily in many cumulative organizational features, with low marginal returns, might have little or no reserves to contain bouts of stress. Such a state might not compete efficiently against a population that is smaller, and weaker in theory, but invests in small but high-return military enterprises.

Conflict/contradictions/mismanagement. It was argued earlier in this text that peasant political action is less likely to occur with a high but static tax burden than in a situation where high taxes produce perceptibly diminishing returns at the local level. In such a situation injustice becomes evident. Similarly, class conflict is more likely a matter of diminishing rather than increasing marginal returns. In the first situation individuals and groups are positioned to get the largest slice of a shrinking economic pie. In a case where marginal returns are on the rise, class conflict can be prevented by creating the impression that opportunities for improvement exist for all classes.

Cases where elites behave irrationally require explanation. Irrational behavior by itself tells little of the story. Service made the astute observation that the success or irrationality of elite behavior is likely a function of circumstance-induced perception. Those who rule simply seem good during successful periods, and vice versa (Service 1975: 312).

The biologist Garrett Hardin once noted a stunningly simple lesson in systems analysis that has powerful implications: "*We can never do just one thing*" (1968: 457 [italics in original]). His argument was that good intentions are practically irrelevant in determining the outcome of disturbance in a large and complex system. With the feedback relationships inherent in such a system, one can hardly ever anticipate the full consequences of any one disturbance. The same principle applies to bad behavior: elite mismanagement can only be partially responsible for the evolution of any complex society.

It is not my wish to imply that leadership is irrelevant, just that it is of much less importance than many believe. Complex societies do not evolve according to the whims of individuals. Circumstance-induced insight is likely to have larger consequences: Leaders look good when the marginal return on investment in complexity is high, since in such a situation almost everything the leader does is dwarfed by the great benefit to society as a whole, obtained from the investment. Conversely, when marginal returns are down there is usually very little that leadership can do in the short term to stem this trend, and therefore anything attempted is doomed to appear incompetent.

Social dysfunction. This vague theme is somewhat diverse, but its central concern seems to lie with mysterious internal processes that prevent both integration and proper adaptation. Little understanding is gained with such ethereal notions. Much more would be learned by focusing on the costs and benefits of adopting complex social structures.

Mystic. The mystical theme is difficult to incorporate into any scientific approach, but some of the particular studies grouped in this theme can be subsumed under the principle of diminishing marginal returns. David Stuart, for example, asserts that complex societies experience cyclical oscillations between more and less complex forms (which he labels "powerful" and "efficient" respectively). The mystical nature of Stuart's formulation emerges when he cannot explain these oscillations, beyond comparing complex societies to insect pests and suggesting that they are "consumed" (Stuart and Gauthier 1981: 10-11). Why do Stuart's "powerful" societies revert to "efficient" ones? Most likely, the answer is that they do so because, being complex societies, they experience a diminishing marginal return on investment in complexity and thus become prone to collapse.

Many of the scenarios under the mystical theme are based on the analogy of growth and old age, or on concepts that carry value judgments, such as "vigour" and "decay". In some ways these scenarios are similar to the theme of elite mismanagement: societies are ranked according to their success in managing circumstances or expanding. Societies capable of doing these things are considered "vigorous" and those unable

are considered "declining". Circumstance-induced perception is a major factor in these appraisals. A society that is experiencing high marginal returns on investment in complexity is likely to be able to expand or contain bouts of stress and appear "vigorous" and "growing". A society in the phase of diminishing marginal returns is likely to be less capable in these matters and thus appear "declining". The concepts of "growth/old age" and "vigour/decay" are vitalistic and subjective. Such terms, which carry value judgments and the concepts related to them, it is better to stop using them. The observations on which they rest, however, can be subsumed under the principle of marginal returns. "Moral weakness" (whatever that means) is more likely to be ascribed to a society that is experiencing diminishing rather than increasing marginal returns. Furthermore, as Borkenau has pointed out, moral crimes are committed all the time by both "vigorous" and "declining" societies (1981: 51).

Random concatenations of events. Chance concatenations cannot explain the collapse, except where harmful combinations of circumstances impact an already economically weakened society.

Economic explanations. The themes that link the economic explanations are the diminishing advantages of complexity, the increasing disadvantages of complexity, and/or the increasing cost of complexity. Such ideas are clearly subsumable under diminishing marginal returns, and indeed this principle offers a global applicability that was previously lacking in economic explanations.

At a more general level, this principle encompasses both internal/external theories of change and social models of conflict/integration. Diminishing marginal returns are an internal aspect of any society, which follow their own dynamic pattern. This pattern is based on the propensity to prefer the least expensive organizational solutions over the most expensive ones. Yet changes in organizational solutions and marginal returns are often the result of the need to respond to changing external conditions.

Conflict and integration theories are also subsumed, as whether people are the beneficiaries or the victims of complexity, the cost/benefit ratio of organizational investment needs to be taken into account. Neither benign nor repressive regimes can long withstand the siege of diminishing marginal returns (although repressive regimes may be able to withstand *something* longer).

The principle of diminishing marginal returns is then certainly capable of incorporating these various approaches to collapse (or at least the most worthwhile parts of them). It offers an overarching theoretical framework that unites various approaches and shows where connections exist between disparate perspectives. From this analysis it appears that a significant spectrum of human behavior and a variety of social theories are clarified by this principle.

Contemporary conditions

At some point, the study of this topic must discuss its implications for contemporary societies, not only as a matter of social responsibility, but also because the findings clearly point in that direction. Complex societies have historically been vulnerable to collapse, and this fact alone is disturbing to many. Although the collapse is an economic adjustment, it can nevertheless be devastating where a large part of the population does not have the opportunity or the capacity to produce primary food resources. Many contemporary societies, particularly those that are highly industrialized, obviously fall into this category. Collapse for such societies would almost certainly entail great upheaval and enormous loss of life, not to mention a significantly lower standard of living for the survivors.

Contemporary concern about collapse has already been mentioned on other occasions. No doubt much of the public's fascination with lost civilizations derives from the indirect threat implicit in such knowledge. "We are aware", wrote the noted French social philosopher Paul Valéry, "that a civilization has the same fragility as a life" (1962: 23). Certainly, this concern sometimes extends to the very survival of the human species. There are astrophysicists who are currently developing a theory that suggests that the cyclical approach of a distant star to Earth produces huge comet showers that periodically wipe out multiple forms of life and that they will affect the human race in the same way on their next visit (Perlmann 1984).

Other scenarios for contemporary collapse include:

- Nuclear war and climate changes associated with it
- Increasing atmospheric pollution, leading to ozone depletion, climate change, saturation of global circulation patterns and similar disasters
- Depletion of crucial industrial resources
- The widespread economic collapse, caused by such things as national and international non-refundable debts, interruptions in the availability of fossil fuels, hyperinflation and the like

Faced with such a list of towering problems and constantly bombarded with media attention devoted to these and other dilemmas, people are naturally concerned. For reasons that are more or less rational, a sizeable section of the population in Western industrial societies fears that one or more of these factors will cause a crash and a new dark age. It is thought that only one layer of complexity separates us from the primordial chaos, the Hobbesian war of all against all. Such fears result in a considerable level of political activity, and both national priorities and international politics are influenced to a significant degree by this popular concern. Some people stockpile food or dig fallout shelters waiting for a political process to fail to resolve the situation. Others go further, stockpiling weapons and conducting paramilitary training, even participating in military exercises, in anticipation of the day the ghost of Hobbes rises, when we are all reduced to Ik conditions.

A not inconsequential market has sprung up from this, including survival books and magazines and an industry that produces post-collapse necessities such as weapons, survival tools and freeze-dried food. Many of those who are less extreme, however, have lately become interested in growing their own food, making their own clothes, and building themselves a shelter. Magazines that focus on issues such as organic gardening contain articles and advertisements extolling the virtues of a lifestyle that reduces one's dependence on an ultimately unreliable industrial economy.

It is easy to overemphasize such issues, given that only a small part of the population is actively preparing for collapse. On the other hand, no educated person who is aware of historical collapses can avoid occasionally reflecting on current conditions. By clinically treating such concerns as social phenomena, I do not wish to minimize their validity. Except for some of the more extreme prospects, there may actually be cause for alarm. Certainly, no one can argue that industrialism will not *one day* have to deal with resource depletion and its own waste. The main question is how far away that day is. All this preoccupation and interest in collapse and self-sufficiency may itself be a significant social index, the expected exploratory behavior of a social system under stress in which it is advantageous to seek lower-cost solutions. A colleague with whom I corresponded about this work asked (humorously, I guess) if it would be finished before our own civilization collapsed.

As has been the case in the study of historical collapses, those concerned with current conditions have ignored the principle of marginal returns to investment in complexity. Discussing whether industrial civilization will be destroyed in a nuclear war or in a cosmic collision is speculation and besides the point here. What we can address here are issues that are known to be important to all societies: the costs and benefits of investing in complexity.

Some of the data analyzed is certainly disturbing in this regard. Patterns of diminishing marginal returns can be observed in at least some contemporary industrial societies in the following areas:

- Agriculture
- Mining and energy production
- Investigation and development
- Investment in health
- Education
- Government, military and industrial management
- GDP productivity⁹ to produce new growth
- Some elements of the technical design improvement

Some caveats about such tendencies are in order. The examples of diminishing marginal returns were chosen here eclectically to illustrate the view that complex societies regularly experience such tendencies. They are just examples, not a rigorous analysis of any modern economy. Such observations do not constitute a complete ex-

⁹ Gross Domestic Product, *GNP* in the original. *N. of the t.*

amination of the marginal return that any particular society is experiencing, *across the board*, in investing in complexity. There may be favorable countertrends in some areas, perhaps in microprocessor technology. However, the disturbing nature of the statistics presented cannot be denied. It is clear that at least some industrial societies are currently experiencing diminishing marginal returns in a number of crucial and costly investment areas.

There are two opposite reactions to such trends. On the one hand, there are a number of economists who, despite their discipline's reputation for pessimism, believe that we are not facing a real scarcity of resources, but only solvable economic dilemmas. They assume that with sufficient economic motivation, human ingenuity can overcome all obstacles. Three quotes represent this approach.

No society can escape the general limits of its resources, but no innovative society need accept Malthusian diminishing returns. (Barnett and Morse 1963: 139).

All energy observers seem to agree that various energy alternatives are virtually inexhaustible (Gordon 1981: 109).

By allocating resources to R&D¹⁰, we can deny the Malthusian hypothesis and prevent the conclusion of the apocalyptic models (Sato and Suzawa 1983:81).

In the opposite perspective, supported by environmental defenders, current well-being is purchased at the expense of future generations. From the environmental perspective, if we allocate more resources to R&D and it succeeds in stimulating more economic growth, this will only lead to faster depletion, hasten the arrival of the inevitable crisis, and make it worse when it comes (eg, Catton 1980). Implicit in such ideas is a call for economic decline¹¹, a return to a simpler era of less consumption and local self-sufficiency.

Both perspectives are held by well-intentioned people who have intelligently studied the matter and have come to opposite conclusions. Both approaches, however, suffer from the same flaw: they have left out key historical factors. The optimistic approach will be addressed first at this point, the environmental perspective later.

Economists base their beliefs on the principle of infinite substitutability. The foundation of this principle is that by allocating resources to R&D, alternatives to energy and raw materials in scarcity can be found. So when wood, for example, has become expensive, it has been replaced for many uses with masonry, plastics, and other materials.

One problem with the principle of infinite substitutability is that it cannot be applied, in any simple way, to investments in organizational complexity. Sociopolitical organization, as we know, is one of the main arenas of diminishing marginal returns,

¹⁰ Research and Development. *R&D* (*Research & Development*) in the original. *N. of the t.*

¹¹ *Undevelopment* in original. It has been loosely translated as decrease also on a few later occasions in this text. *N. of the t.*

and one for which no substitute product can be developed. Economies of scale¹² and advances in information processing technologies do help reduce organizational costs, but are also ultimately subject to diminishing returns.

A second problem is that the principle of infinite substitutability is, despite its name, difficult to apply indefinitely. A number of insightful scientists, philosophers, and economists have shown that the marginal costs of research and development have become so high that it is questionable whether technological innovation will be able to contribute to the solution of future problems as much as it did to past ones (D. Price 1963; Rescher 1978, 1980; Rifkin with Howard 1980; Scherer 1984). Consider, for example, what it will take to solve the food and pollution problems. Meadows and his colleagues note that increasing world food production by 34 percent between 1951 and 1966 required a 63 percent increase in spending on tractors, 146 percent on nitrate fertilizers, and 300 percent on pesticides. The next 34 percent increase in food production would require even more capital and resource income (Meadows *et al.* 1972: 53). Pollution control shows a similar pattern. Disposal of all organic waste from a sugar processing plant costs 100 times more than disposal of 30 percent. Reducing sulfur dioxide in the air of a US city to a 9.6-fold lower concentration, or particulate matter to a 3.1-fold lower concentration, increases the cost of control 520-fold¹³ (Meadows *et al.* 1972: 134-5).

It is not that R&D cannot potentially solve the problems of industrialism. The difficulty is that doing so will require an increasing share of GDP. The principle of infinite substitutability depends on energy and technology. How can economic growth be sustained with diminishing returns on investment in scientific research? The answer is that to sustain growth, resources from other sectors of the economy will have to be diverted to science and engineering. The result is likely to be at least a temporary decline in living standards, as people will have comparatively less to spend on food, housing, clothing, medical care, transportation, or entertainment. Of course, the allocation of increased resources to science is nothing new, but merely the continuation of a two-century-old trend (D. Price 1963). Such an investment, unfortunately, can never produce a permanent solution, merely relief from diminishing returns.

As we know, in past societies diminishing marginal returns led to weakness, disintegration or collapse. If we manage to escape nuclear annihilation, if we manage to control pollution and population and manage to circumvent resource depletion, then will our fate be marked by the high cost and low marginal return these things will require? Will we discover, as some past societies have, that the cost of overcoming our problems is too high in relation to the benefits conferred and that not solving the problem is the economic option?

¹² In economic theory, *economy of scale* is understood as the advantages in terms of costs that a company obtains thanks to expansion. There are factors that cause the average cost of a product per unit to fall as the scale of production increases. *N. of the t.*

¹³ *Reducing sulfur dioxide in the air of a US city by 9.6 times, or of particulates by 3.1 times, raises the cost of control by 520 times* in the original. *N. of the t.*

In fact, there are big differences between today's world and the ancient world that have important implications when it comes to collapse. One of these is that today the world is full. That is, it is full of complex societies; they occupy every sector of the globe, except for the most desolate. This is a new factor in human history. Complex societies as a whole are a recent and unusual aspect of human life. The current situation, where *all* societies are so peculiarly constituted, is unique. Earlier in this text it was shown that ancient collapses occurred, and could only occur, in a power vacuum, where a complex society (or a grouping of comparable governmental systems) was surrounded by less complex neighbors. Today there are no power vacuums left. Each nation is linked to, and influenced by, the major powers, and most are strongly linked to one power bloc or another. Combine this with instantaneous global travel and, as Paul Valéry noted, "...*nothing can ever happen again without the whole world participating*" (1962: 115 [italics in original]).

Today collapse is neither an option nor an immediate threat. Any nation vulnerable to collapse will have to pursue one of three options: (1) takeover by a neighbor or some larger state; (2) financial support from a dominant power, or from an international financial agency; or (3) payment by the supporting population of any costs necessary to maintain complexity, no matter how detrimental to marginal performance. Today a nation can no longer unilaterally collapse, for if any national government disintegrates its population and territory will be absorbed by someone else.

Although this is a recent innovation, it has analogies with past collapses, and these analogies can provide insight into current conditions. Past collapses, as discussed, occurred in two types of international political situations: dominant isolated states and clusters of comparable governmental systems. Isolated and dominant states disappeared with the advent of global travel and communication, and now what remains are competing comparable governmental systems. Even if today there are only two comparable governmental systems, with their allies grouped in opposing blocs¹⁴, the dynamics of competitive relations are the same. Comparable governmental systems, such as post-Roman Europe, ancient Greece and Italy, the Warring States of China, and Mayan cities, are characterized by competitive relationships, vying for position, formation and dissolution of alliances, expansion and contraction. territories and continued investment in military advances. An upward spiral of competitive investment unfolds, as each government system continually seeks to outdo its peer(s). None can dare to withdraw from this spiral with realistic diplomatic guarantees, as doing so would be nothing more than an invitation to domination by another. In this sense, although industrial society (especially the United States) in popular thought is sometimes compared to ancient Rome, an analogy with the Mycenaeans or the Mayans would be more accurate.

Groupings of comparable government systems tend to evolve toward greater complexity in unison so that, driven by competition, each partner mimics the new orga-

¹⁴ The book was written in 1988, before the disintegration of the Soviet Union. *N. of the t.*

nizational, technological, and military features developed by its competitor(s). The marginal return on such innovations decreases as each new military advance is met with some countermeasure and thus does not bring greater security or lasting benefits. A society trapped in a cluster of comparable competitive government systems must invest more and more without gaining any increase in returns and is therefore economically weakened. And yet the option to retreat or collapse does not exist. So collapse (due to diminishing marginal returns) is not in the *immediate* future of any contemporary nation. This, however, is not so much because of something we have achieved as because of the competitive spiral in which we have allowed ourselves to become trapped.

This is the reason why the proposals for economic decrease, to live in balance on a small planet, will not work. Given the close link between economic and military power, unilateral economic degrowth would be equivalent to, and just as senseless as, unilateral disarmament. We simply do not have the option to return to a lower economic level; at least not a rational choice. Competition between comparable government systems leads to increased complexity and resource consumption without regard to costs, human or ecological.

I do not wish to suggest by this analysis that any major power would be rapidly at risk of collapse were it not for this situation. Both the primary and secondary world powers have enough economic muscle to finance diminishing returns for quite a few years. As seen in the Roman and Mayan cases, peoples with sufficient economic incentives and/or reserves can endure diminishing marginal returns for centuries before their societies collapse. (This fact, however, is no reason for complacency. Modern evolutionary processes, as is well known, occur at a faster rate than those of the past.)

However, there are a large number of smaller nations, which have invested quite heavily in military power disproportionate to their economic base, or in development projects with questionable marginal returns, that may well be vulnerable. In today's world they will not be allowed to collapse, but will be rescued either by a dominant partner or by an international financial agency. Such instances reduce the marginal return that the world as a whole gets from its investment in complexity.

Comparable government systems then tend to suffer from long periods of spiraling competitive costs and diminishing marginal returns. This ends finally with the domination by one of them and the acquisition of a new energetic contribution (as in the Roman Republic or in the Warring States of China), or with the mutual collapse (as between the Mycenaeans and the Mayans). The collapse, when it comes again, and if it does, will be global. No single nation can collapse anymore. World civilization will disintegrate as a whole. Competitors that evolve as pairs collapse in the same way.

In ancient societies, the solution to diminishing marginal returns was to obtain a new energy supply. In economic systems driven largely by agriculture, livestock and human labor (and ultimately by solar energy), this contribution was achieved through territorial expansion. Ancient Rome and the Ch'in of the Warring States of China took this course, as did countless other empire builders. In an economy that is today

driven by stored energy reserves, and especially in a world that is full, this course is not feasible (nor was it ever permanently successful). Available capital and technology must instead be directed toward some new and more abundant energy source. Technological innovation and increased productivity can prevent diminishing marginal returns, but only for a time. At some point a new energy supply will be essential.

It is difficult to know whether global industrial society has already reached the point where the marginal return to its general pattern of investment has begun to decline. The great sociologist Pitirim Sorokin believed that Western economies had entered such a phase at the beginning of the twentieth century (1957: 530). Xenophon Zolotas, on the other hand, predicts that this point will be reached shortly after the year 2000 (1981: 102-3). Even if the point of diminishing returns for our current form of industrialism has not yet been reached, that point will inevitably come. Recent history seems to indicate that we have at least achieved diminishing returns to our reliance on fossil fuels and possibly some other raw materials. A new supply of energy is necessary to avoid a decline in the standard of living and a future global collapse. A more abundant form of energy might not reverse the diminishing marginal return to investment in complexity, but it would make it more feasible to finance that investment.

In a sense, the lack of a power vacuum, and the resulting competitive spiral, have allowed the world to postpone what might otherwise have been an earlier confrontation with collapse. Certainly, there is a paradox here: a disastrous condition that everyone condemns can force us to tolerate a situation of diminishing marginal returns for long enough to achieve a temporary solution to it. This extension must be used rationally to seek and develop the new energy source(s) that are necessary to maintain economic well-being. This research and development must be a matter of the highest priority, even if, as predicted, this requires the reallocation of resources from other economic sectors. Adequate financing of this effort should be included in the budget of every industrialized nation (and the results should be shared among all). I won't get into politics suggesting whether this should be privately or publicly funded, just that it should be funded.

There are touches of optimism and pessimism in the current situation. We are in a curious position where competitive interactions force a diminishing level of investment and marginal return, which could ultimately lead to collapse unless the competitor that collapses first is simply dominated or absorbed by the survivor. In that way relief from the threat of collapse might be achieved, although we might find that we do not like to bear its costs. The fact that the collapse is not going to happen in the immediate future does not mean that the industrial standard of living is also assured. As marginal returns decline (a process that is ongoing even now), and until such time as a new input of energy becomes available, the standard of living that industrial societies have enjoyed will not rise as rapidly, and for some groups and nations may remain static or decline. The political conflicts this will cause, coupled with the ever-easier availability of nuclear weapons, will create a dangerous world situation for the foreseeable future.

To some degree, there is nothing new or radical in these comments. Many others have expressed similar observations about the current scene, in greater detail and with greater eloquence. What has been achieved here is to place contemporary societies in a historical perspective and to apply a global principle that links the past with the present and with the future. As much as we like to believe we have something special in world history, in reality industrial societies are subject to the same principles that caused earlier societies to collapse. If civilization collapses again, it will be because of not having been able to take advantage of the present extension, an extension that is paradoxically as harmful as it is essential for our expectations of the future.

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Presentation of "THE SHADOW OF THE PAST"

Below, we reproduce the final chapter of the book *Green History of the World*, by Clive Ponting (1992, Ediciones Paidós Ibérica). We do so not so much because we share the arguments or the data used by the author, but because of the general analysis that he makes of civilization up to the 20th century. This analysis highlights the important consequences of two "transitions", as the author calls them: the adoption of agriculture and industrialization. Both have conditioned and will surely condition the ways of life and the general behavior of the societies that have been adopting them. The expansion of agricultural and industrial cultures takes on a fundamental importance when it comes to understanding how societies develop, above any other cultural factor. This means that it is the "material factors" (technology, demography, ecology, etc.) that shape the main characteristics of a society and those that condition and determine its future evolution, above other factors (such as their form of government, their religion, their ideology, etc.). This text provides such an analysis; therein lies his main interest.

Some of the data I present may be out of date as it dates from 1991. Ponting revised this book and republished it in 2007 under the title *A New Green History of the World*. As far as we know, there is no translation in Spanish.

Other data is still valid. It was by chance that a few days before writing these lines [2011] it became official that humanity had exceeded the figure of 7,000 million inhabitants. And the projection for 2025 is to reach 8,000 million, which is the figure that Ponting gives.

Population growth is a clear example of what the primacy of material factors means. No government has decided that these figures had to be reached, but rather that this increase in the human population is a direct consequence of industrialization. The size of the human population is a key factor in understanding the impact it will have on nature.

Ponting states that: "A looming global crisis and social decline caused by the depletion of raw materials and energy currently seem less likely to occur in the immediate future [...]. The most serious and immediate pressures are now taking place in the form of degradation and destruction of some of the other vital resources on which societies depend: global environmental regulators, soil, water, air and biodiversity." It is doubtful that this probability is less, since, after all, it is the search for raw materials and energy sources to satisfy the growing needs of techno-industrial society that mainly generates the degradation and destruction of these "vital resources". ". If one is linked

to the other, this calculation of probability is shocking. Perhaps this is because at the time the book was written, models studying the importance of resource depletion were discredited and believed to be unreliable, as described by Ponting (see "The Limits to Growth After Peak Oil," Charles AS Hall and John W. Day, Jr., *Research and Science*, October, 2009).

Finally, it is necessary to point out what has been a general trend within some ecological analyses: the inclusion of inequality in the distribution of wealth among nations (and "social inequality" in general) as one more variable to study within the ecological perspective. Ponting's text does not escape this defect.

THE SHADOW OF THE PAST

*By Clive Ponting*¹

The pillars of human history are based on the way ecosystems function. All living beings on Earth, including human beings, are part of these complex networks of interdependence between the different plants and animals that constitute a food chain and that go from photosynthesizers at the base, through herbivores, up to the carnivores at the top. Due to the decreasing energy efficiency of the food chain, the number of creatures that can be supported at each level is progressively reduced. When the direct ancestors of human beings appeared, probably in East Africa two million years ago, they functioned practically as herbivores, but they were also carnivores, collecting dead animals and doing some hunting. Their numbers were therefore conditioned by the ability of local ecosystems to support animals at the top of the food chain.

Human history is, on a certain level, the history of how these constraints have been overcome and of the consequences that this has had for the environment. The most important departure from basic ecological constraints has been the increase in human numbers well above the level that natural ecosystems could support. The first steps were the gradual expansion of human beings throughout the world and the adoption of techniques that would allow them to dominate the terrestrial ecosystems. This depended on a series of special attributes that had their origin in the great increase in the size of the brain: language, social cooperation and the development of various technologies (very simple at first) that allowed them to delve into the adaptation process to very diverse habitats. In this phase, people lived by gathering and hunting food, and their impact on the environment was generally limited, except for a few cases such as the extinction of large mammals at the end of the last glacial period, due to their way of to get food, because of their nomadic lifestyle, their lack of property and their relatively small numbers. But the number of human beings was growing very progressively, perhaps up to four million people around the year 10,000 BC. The pressure of population growth did not weaken, and these groups managed to overcome ecological

¹ Final chapter of the book *Green History of the World* (1992, Ediciones Paidós Ibérica). *Editor's Note.*

constraints with the adoption of agriculture . It was not a sudden process: initially it meant little more than a more intensive use of already existing ways of obtaining food. But the final result was the alteration or destruction of natural ecosystems, since all agricultural activity supposes the creation of an artificial environment to cultivate selected plants and take care of domestic animals.

defining moment in human history, the abandonment of a way of life that had prevailed for two million years. It went some way to solving the problem of how to feed an ever-increasing number of people, but in doing so it opened the way for even more intense population growth. Agriculture, once adopted, proved to be a generally effective means of supporting more people than ever before by putting more land into production and using more intensive farming methods than hitherto. The human history of the last ten thousand years has been shaped by this agriculture-based population explosion: a population increase from four million people to five billion. Behind this global trend were some major fluctuations and some individual cases of agricultural failure, societies that ultimately failed to maintain the particular artificial habitat they had created and come to depend on, and in which the superstructure proved too much for the pillars. .

Until the end of the 18th century, the global rate of population growth was generally slow due to the difficulty of keeping the growth of food production and population numbers at the same rate. However, as more land was put into cultivation, more people were fed. It was not until two hundred years ago, with improvements in health, increased agricultural production, and the growing importance of commerce, industry, and services, that the world's population began to expand rapidly. In the 1980s the Earth had to support some 90 million new people each year. An increase of the same size as the total population of 2,500 years ago. These people have had to be fed, housed, clothed and provided (to varying degrees) with goods and services. Even if per capita consumption had not increased, this immense rise in population numbers would have to place ever-increasing demands on the Earth's resources. Most of these demands were motivated by basic human needs. As more land was needed to grow food, more natural ecosystems were destroyed. Wood was needed to build houses and for cooking and heating, so forests were gradually cleared. Metal ores were needed to make tools and luxury items, thus consuming the Earth's mineral resources. People had to be clothed, so the land had to be farmed to grow cotton, animals had to be cared for for wool and fur, and wild animals had to be hunted for their skins.

The increasing demand for resources caused by the growth in population numbers not only put stress on the environment, it also forced the development of more complex techniques that required more effort. Agriculture illustrates this process very well. With gathering and hunting, the level of effort required to obtain an adequate and varied diet is relatively low. The adoption of agriculture required more work such as planting, weeding, watering, harvesting and storing. Domesticated animals required activities such as guarding, milking, shearing, herding, providing food in winter, building fences, and providing shelter. In exchange for more effort, more food production was achieved on less land although, as agriculture depended on a smaller variety of crops, agricultural

societies actually faced a greater risk of inadequate food reserves compared to with groups dedicated to gathering and hunting. Each type of agriculture requires very different levels of effort to obtain food. The one that requires the least work is slash-and-burn agriculture, since with it it is not necessary to weed or fertilize and the only tool needed is a stick to dig. It seems likely that only the pressure of population growth (which reduced the length of fallow periods during which the canopy could regenerate and the soil could regain its fertility) forced people to establish permanent fields and take on the additional task of clear the grasslands and plow. Paddy fields and irrigation also require higher levels of effort. Modern intensive methods, while using less labor, require even greater inputs, such as machines, fertilizers, pesticides, energy and resource consumption, to reach the high levels of production needed to feed a larger population.

The same type of results motivated by the increasing demographic pressure can be seen in the case of clothing. The first human beings used to dress the skins of the animals that they had killed or that they had collected already dead. As the population increased, this ceased to be possible and textiles were made with natural fibers such as linen, cotton and wool. This forced the use of land to grow crops or graze animals, as well as additional effort to spin and weave raw materials. These methods, along with hunting and trapping wild animals for their skins, provided sufficient clothing for centuries. The rapid population increase of the 19th century, the need to use more land to grow food rather than other crops, and the massive destruction of many species of furry animals put these resources under increasing strain. Only the appearance of methods of manufacturing artificial fibers from chemical products has made it possible to clothe the world population in the 20th century. But these more complex manufacturing techniques consume more resources and more energy.

The same sequence of increasing demands that caused shortages and forced the adoption of new technologies and the use of new resources can also be seen in the case of writing materials. With low productivity where finding enough food to feed humans was a difficult task, medieval Europe (and also China) could only support a small number of animals due to the difficulty of feeding them, especially in winter. The amount of parchment and vellum paper (made from animal skins) that could be produced was therefore strictly limited. As the demand for writing materials increased, these materials had to be replaced by what was considered an inferior product, paper made primarily from wood pulp. The consequence was that more trees were felled (and large pine and eucalyptus monocultures were created in the 20th century) to maintain an industry with a wide assortment of paper products and ever-increasing production.

Similarly, the scarcity of wood supplies in Europe led to an increase in the use of a fuel that was considered to be of inferior quality, coal, which required more effort in mining activities and in transport than wood and which was more difficult to use in many industrial processes. As energy demands have continued to rise, even more technologically complex processes such as offshore oil production have had to be developed.

From one perspective, this invention of new techniques and more complicated production processes and the use of more resources can be seen as *progress*, the increasing ability of human societies to control and modify the environment. In order to meet their needs displaying a large dose of ingenuity and a great ability to respond to challenges and find solutions to problems. From an ecological perspective, the process looks like a succession of increasingly complex and environmentally damaging ways of meeting the same basic human needs.

It was the first great transition in human history - the adoption of agriculture and the consequent rise of sedentary communities - that propelled human society down this path. It made it possible to feed more people, although the figures were often not in line with the capacity of the agricultural system, perpetually exposed to the vagaries of weather and climate change, thus causing widespread malnutrition and a recurrence of hunger. The second great transition in human history - the use of fossil fuel energy sources and the spread of industrialization - marked a massive leap in the process of using more of the Earth's resources to support many more people, which allowed some of them to be supplied with much more food and products than they had had until then. For the first time in human history, free energy was available, allowing industrial production, and with it the rate of consumption of the Earth's resources, to grow to unprecedented levels. It has been calculated that the *additional* industrial production achieved in the world *every* decade since 1950 is equal to the total industrial production of the world up to that time.

Since 1800, the world population has multiplied by five in less than two hundred years, necessitating a huge increase in agricultural production and the destruction of large areas of natural ecosystems hitherto intact, as well as the use of much more intensive ways of cultivating some already heavily modified ecosystems that made up the existing agricultural land. A large proportion of this increased population has been concentrated in cities, where population numbers have risen from some twenty-five million people to more than two billion.

The amount of pollution generated by human activities has increased faster than the population and the level of industrialization. Its nature has also changed since 1945 with the increasing production of unnatural products, often toxic in even minute amounts, that natural ecosystems cannot break down.

The effects of the first great transition were felt in virtually every area of the world: agriculture was adopted independently in different places, and distinct settled societies appeared in the Middle East, in China, in the Americas, and elsewhere. The second big transition was different. It was a process dominated from the beginning by a part of the world, first Europe, later North America and then Japan. The reasons for this lie primarily in the establishment of increasing control over the rest of the world in the centuries after 1500. This control took very different forms: colonization, colonies, and colonial trade by European countries, followed by the United States and later by Japan, which launched a different, but also very effective, form of dominance through trade. Since 1945, these countries have managed to ensure their continued dominance

of the world economy not only through their overwhelming political, military, and economic potential, but also through international institutions and control over aid and the distribution of surplus food.

Until four or five centuries ago, all societies in the world depended almost entirely on the resources they could obtain from the specific area where they settled; trade was limited and transportation poor. Since 1500, Europe and the industrialized countries have had access to the world's resources, firstly for a greater variety of foods and later important staples, and secondly for a source of raw materials (and also of markets) for its continued industrial expansion.

The expansion of Europe can be seen as the gradual establishment and expansion of empires and as the transmission of "civilization" to less fortunate peoples. From an ecological perspective, such an expansion looks more like a wave of destruction that has swept across the globe. The colonization of North America exemplifies this process. In the forward positions of the frontier, the indigenous inhabitants came under European influence and, finally, under their control, beginning with the activities of traders and trappers. The settlers dispossessed them of their land and drove them west, where the process was repeated until they were reduced to a sad memory of a once prosperous people. As they expanded their activities, fur hunters and trappers exterminated many species such as beaver, bison, and passenger pigeon², sometimes completely and sometimes over a wide area. Settlers cleared natural forests and established fields. With so much land, the trend that agriculture followed was to expand to occupy the available space, relocating when poor practices rapidly impoverished the soil and left it in a state susceptible to erosion. As productivity declined, degraded land was abandoned and the crop frontier shifted west. At the same time, logging companies were also clearing forests, and prospecting parties and mining companies were opening mines to extract metals and coal. Industries appeared and with them large cities that sprawled across the countryside without any planning.

The process of going from a pre-industrial society to an industrial one has been called *development*. As with the idea of progress, development has been hailed not only as desirable but as inevitable in order to support more people and to satisfy the seemingly insatiable desire for higher material standards. The institutional and commercial framework created by the first nations that walked the path, and the mindset associated with it, which revolves around the ideas of modern economics and the imperative to maximize GNP, fostered a climate in which the objective of development has come to be accepted throughout the world. Today the tide of destruction can be seen sweeping through the Amazon region of Brazil, a country with immense natural resources, which is vigorously following the course of development. It is the same process of change, in a more concentrated form, which in Europe took several hundred years to complete and which was later reproduced in a select number of countries.

² *Ectopistes migratorius*, refers to a species of North American pigeon that was very abundant until the beginning of the 20th century. Today extinct. *Editor's Note*.

The Amazon, the largest area of tropical forest on Earth and inhabited by some of the last gathering and hunting peoples, was too remote and difficult to exploit on a large scale until the 1960s. It was left open to colonization with the construction of roads within the tropical forest; the population settled along the highway from Brasilia to Belem increased from 200,000 people at the time of its inauguration in 1960 to two million a decade later. Indian tribes suffered immensely from a series of encroachments on their traditional lands: first by gold prospectors, then by land speculators and landless peasants, ranchers, loggers, and civil engineers who built the roads and dams. . Gold prospectors (in 1988 there were 100,000 people trying to find gold as part of the Calha Norte military program to colonize Brazil's northern border area) use mercury to obtain the metal, and this pollutes water over a wide area. In order to get land for settlements and cultivation and, above all, for huge cattle ranches, large areas of forest are burned, even though the grass that grows after the clearing of the forest is too poor to sustain animals for more than a few years. Peasant settlers are encouraged to move to the area in order to relieve pressure to reform land in the rest of the country (more than 80 percent of Brazil's agricultural land is owned by less than 5 percent of the population). In Rondonia (the western part of the Amazon) 70,000 to 80,000 settlers arrive each year, and by the end of the 1980s a third of the forest had been cleared. The pace of forest destruction is growing rapidly. Until the mid-1960s, around 18,000 square kilometers were destroyed in the State of Pará during a century. Between 1975 and 1986, 180,000 square kilometers were destroyed. Probably about a fifth of the Amazon rainforest has been destroyed, with the total increasing by around 20 million hectares each year. Industrial development in the region is currently underway and will further increase the extent of the destruction. For example, the Grande Carajas project in northwestern Brazil will affect one sixth of the Brazilian Amazon (an area the size of Britain and France combined) with a series of plantations, ranches, mines and heavy industries. The dams will flood large areas to supply electricity to new industries. 28,700 square kilometers of forest will be cleared for cattle ranches and 54,000 square kilometers for plantations to grow crops for export. A bauxite mine will produce eight million tons a year (mostly for Japan), and the estimated eighteen billion tons of iron ore in the region (in which some of the higher-quality ore that remains in the world) will form the basis for an iron foundry industry. No pollution controls are planned, and the smelters will be fueled by cutting down the forest to make charcoal; it is estimated that about four million hectares each year.

A political, social or cultural history of the 20th century, and particularly of the last decades of the century, could well reflect a growing disillusionment with the consequences of development and detect a trend towards a greater interest in the idea of conservation and protection of the environment. This has meant the inclusion of environmental topics in both national and international politics as well as the rise of a public campaign to obtain policy changes in areas that affect the environment such as agriculture, industrial regulation, pollution and aid. development. However, such

currents of thought have not displaced the basic philosophy, embedded in Western thought for two thousand years, that sees the "natural world" as something independent made available to human beings for exploitation, nor the economic approach that sees (or claims to see) continued industrialization and increased economic growth as a prerequisite for any environmental improvement.

Nor have increased awareness and campaigns on environmental issues led to significant changes in practice. In recent decades there has been an increase in the number of measures, both national and international, that have been adopted in an attempt to limit damage to the environment, including major international agreements on acid rain and CFC emissions. However, by their very nature, many of the measures - accepting the conservation of wildlife in specific areas, allowing pollution up to certain levels, adding clauses allowing whaling for "scientific" purposes, setting targets without allocating resources to verify its enforcement, giving small amounts of aid to less intensive organic farming while continuing to give large subsidies to other, more intensive types of farming - would be easier to interpret as ways of shoring up the existing economic system than as the first steps towards something new and different .

There have been some achievements, and in some cases (for example, coal smoke pollution in major cities), conditions are undoubtedly better than they could have been. However, compared to the scale of the problems, many measures are little more than simple palliatives. Compared to the powerful impetus induced by continued population growth, by the need for more land to grow food, and by the need for expansion inherent in the global industrial system, the results of these measures on a global scale have been barely noticeable.

It is clear that industrialization is a continuous process. Like agricultural production, industrialization has also been growing steadily. The process has been going on for thousands of years since the appearance of the first potters and blacksmiths, the introduction of the first sources of water power two thousand years ago, and the increasing use of machinery in Europe and China since around the year 1,000. The great acceleration of industrialization from the end of the eighteenth century is so far only the most intense phase of this development.

Nor is there any indication that the industrialized world will stop growing while the rest of the world tries to catch up, or that there will be any large-scale transfer of resources that might help make that possible. Those who speak of "post-industrial society" are referring to a sociological phenomenon of a relative decline in heavy industry from factory production in favor of high-tech and service industries. As industrial production increases, a larger part of the population can be supported in tertiary sector activities, but industrial production continues, continues to increase in fact, and therefore the amount of resources and energy consumed also increases. Deindustrialization may affect some regions within a country, but not modern society as a whole.

What do past experiences suggest about the stability and sustainability of human society as it has developed in the industrialized world and in the partly industrialized but still largely agricultural Third World? Contemporary societies are subject, as a

consequence of past events, to a series of pressures that influence the quality of life of many of their citizens, pressures that have their origin in unequal access to wealth and food, in the scarcity of resources, pollution, health problems and reduced life expectancy. However, both individuals and societies are remarkably tolerant and flexible. For thousands of years human beings have lived with the consequences of various forms of environmental degradation without necessarily incurring in social deterioration. In some cases societies have succumbed to environmental pressures, but the decline and eventual collapse was usually prolonged (in Mesopotamia it came gradually over at least a thousand years), and the generations that went through this process probably did not they warned that their society was facing a long-term decline. Even if the collapse came relatively quickly (as on Easter Island and in the case of the Maya), the significance of the preceding period during which problems grew might not be fully apparent to those who lived during that time.

The environmental problems the world is now facing stem from a series of pressures that have been developing over long periods of time, some of them restricted to specific areas while others affected the whole world. During this same period, the political history of the world has produced a large number of highly unequal states, all asserting their right to independence and national sovereignty, but at the same time compelled to cooperate within a larger international system. Relations within this system, as in the past, are characterized as much by rivalry and conflict as by cooperation. This means that, given the highly unequal distribution of wealth and energy in the world that has taken place in the last five hundred years, it is extremely difficult to deal with problems that cross national borders and problems that entail significant financial and social costs. The effects of the various pressures that the world has suffered (whether interpreted as evidence of increasing social deterioration or not) have been, and will continue to be, experienced by each country and each region in radically different ways, thus reinforcing the difficulties inherent in the design of coherent international strategies or even compatible national strategies.

Past experience suggests that these pressures will continue to be felt in four main areas: increased strains on resources, unequal creation and distribution of food and wealth, a growing weight of demographics, and the threat of socially generated products. industrial in the form of pollution. In each of these areas the shadow of the past hangs over all modern societies as they try to find solutions.

The ability to use more resources has always been essential to the continuation of industrial society. In 1972 the Club of Rome published a controversial book, *The Limits to Growth*, which foresaw a collapse in industrial production and an uncontrollable decline in population over a period of a century, largely the result of depletion of resources and energy reserves. The computer models on which the study was based, and the assumption of continued exponential growth in production, have proven unreliable. The experience of the 1970s and 1980s showed that the main immediate threats to the world did not come from a shortage of resources or even from a shortage of energy, although at some point these non-renewable sources are bound to become extinct.

With the exception of one or two specialized minerals, it is estimated that the known reserves of metals are sufficient for at least a century and in most cases even more. It is likely that new reserves will be discovered (as has happened in the past) and recycling and substitution of materials can be increased. Past experience suggests that these processes will require additional energy to use lower quality minerals and this, together with the continued growth in demand for energy and oil-based products at all points in the system, something that has been observed for several hundred years, it is likely to cause problems. The world's known coal reserves are sufficient for several centuries. According to current projections, known oil reserves could last only until the first quarter of the 19th century, although the total exploitable reserves available on Earth are still unknown. World oil consumption is seven times what it was in 1940, but known reserves have been growing at an even faster rate, roughly 2 percent a year above consumption. During the great *boom* of fossil fuels, alternative energy sources have been neglected, with the exception of high-tech programs, and this field has considerable capacity to create new energy sources.

As regards resources in general, the main problems in the near future may be one of access and whether or not the experience of the last two hundred years of relative abundance of energy at low prices can continue. A threatening global crisis and social deterioration caused by the depletion of raw materials and energy now seem less likely to occur in the immediate future (although these problems, and therefore the future of industrialized societies, will have to be faced). sometime in the future). The most serious and immediate pressures are currently taking place in the form of degradation and destruction of some other vital resources on which societies depend: global environmental regulators, soil, water, air and biodiversity.

In the last two hundred years, industrialized countries have reached levels of consumption and affluence (and have experienced the problems that accompany this growth) that would have been unimaginable for previous generations. This has been achieved by consuming the vast majority of the world's energy reserves and resources (and creating a similar proportion of the world's pollution). The United States has about 5 percent of the world's population, but consumes 30 percent of the world's energy and 40 percent of the rest of its resources. The other side of the coin is that more than 55 percent of the world's population that still lives in rural areas continues to depend directly, like their ancestors, on agriculture for their livelihood. About half of the world's population (2.5 billion people) is undernourished, 20 percent (about a billion) live in absolute poverty and lack basic needs such as clean water, hygiene and decent housing, and only a few fewer are illiterate. Even if current European and American consumption levels were to stabilize, it is highly doubtful that the rest of the world (more than 20 percent of all people on Earth) could ever repeat the process of industrialization and reach these levels. The number of people in the world is expected to reach six billion by the end of the 20th century. For them to live with current European (not American) consumption levels, steel production would need to increase 140-fold and a similar increase in other key materials. There are unlikely to be enough

mineral or energy resources on Earth to sustain this level of production, and the consequences of doing so would likely be catastrophic in terms of pollution. Similarly, to feed the entire world the diet enjoyed by the average American, and using the same level of resources in agriculture, would require the entire world's current oil production and deplete known reserves in little more of a decade. But the non-industrialized world aspires to industrialization along the Western model, and some countries are moving steadily down this path. This raises major issues of equity as to whether the Third World could or should be prevented from industrializing due to the consequences that this could have in terms of resource consumption and pollution, when the current problems of unequal development and pollution are primarily the responsibility of the industrialized world.

For ten thousand years the weight of the numbers of human beings has been a factor that has crucially determined the ability of societies to feed their citizens and provide them with a decent standard of living. The industrialized world (completing its period of rapid population growth in the 19th century) is having to adjust to lower birth rates and unbalanced age structures while, in the rest of the world, the continuation of two centuries of extremely fast is producing great tensions in the Third World.

The world population at the end of the 1980s was five billion and, given the number of young people and the estimated birth rate, it will reach eight billion by the year 2025 and will be even higher as the century progresses. 95 percent of this growth will occur in the Third World, where the pressure on scarce resources and on the limited amount of land is already very intense. During the 1980s, the total amount of land devoted to agriculture in the world increased at a rate of only 0.1 percent per year, and the amount of arable land actually declined due to the effects of agricultural expansion. From the past. What remains is either too steep (as in the Andes), too acidic, too dry (as in most of Africa), or located in the tsetse fly zone of Africa where trypanosomiasis (sleeping sickness) is rife). About a quarter of the world's area has been used for grazing cattle, and although arable land could be extended to this area, the net increase in food production would be small, and past experience suggests that these soils, if are tilled, they can suffer severe erosion very quickly. Apart from this, the only land that could be used for agriculture is in the tropical forests, where the soils are poor and produce crops only for a limited time and where it is clear that the consequences of clearing the forests would be catastrophic for the environment. ambient. It is therefore highly unlikely that the world will be able to feed, let alone the other resources needed to maintain it, the population growth that is expected without a radical restructuring of the global food consumption pattern that has developed over the last five centuries through from the expansion of Europe. If this does not happen, current levels of malnutrition, hunger, starvation and death may increase among the world's poorest people.

The fourth area where tensions have been rising for two centuries is the unwanted effects of the industrial system. Specifically, the events of the second half of the 20th

century have raised the question of to what extent societies can pollute the environment with impunity.

Experience suggests that societies can tolerate horrific conditions on a localized scale, for example those that occurred in heavily industrialized parts of Britain and the United States during the 19th century, and in parts of Eastern Europe in the mid-20th century. albeit at the cost of shortened lives, increased disease and widespread environmental degradation. Even dramatic local disasters, such as the deaths of thousands of people in Bhopal or the massive radioactive fallout that followed the Chernobyl explosion, can occur without any major change in industrial society as a result. However, the volume of pollution from the 20th century, which until now has been largely produced by the industrialized world, is still increasing in these countries and will continue to grow as other countries, notably China, India and Brazil, they try to industrialize themselves. Many of the pollution problems facing Western Europe, North America, Japan, and later Eastern Europe - smoke pollution, heavy metals in the atmosphere, sulfur dioxide emissions from burning fossil fuels, and acid rain - will still be widespread. I went to more

More dangerous still will be the increase in the variety and volume of highly toxic chemical products that reach the atmosphere and the water. It will not be just the animals in these ecosystems that will suffer; the higher cancer rates seen in the industrialized world during the 20th century are likely to be caused in part by the massive increase in chemical pollutants, and these rates may therefore continue to rise. The threat that CFC emissions have posed to the ozone layer over the last sixty years is likely to intensify for a few decades and remain substantial well into the 21st century, despite the agreement reached in London in 1990.

The greatest tensions within the global system, however, come from the production of greenhouse gases as a direct consequence of the concentrated explosion of industrial activity that began two hundred years ago. Serious attempts to control emissions would raise fundamental questions about the way of life that has been generated in the industrialized world and also about equality between industrialized nations and the rest of the world.

It is now virtually inevitable, even if strict controls are rapidly introduced, that global temperatures will rise to a level never seen before in settled societies, and not even in the last 100,000 years or possibly more. Food production will be altered, the latest United Nations forecasts suggest a 10 percent drop in production and a 70 percent reduction in American grain exports, which will intensify the problem of feeding a world population in fast growth.

Even more worrying is the rate of global warming, which will almost certainly be far above the natural rate of the past and too fast for natural ecosystems to adapt, causing widespread damage. All of the world's ecosystems will surely be affected by human-produced pollution, but in unpredictable ways. Global warming is therefore a demonstration, for the first time on a world scale, of the consequences of ignoring, as

sedentary societies have done for most of their history, vital ecological limitations. The consequences for existing life on Earth and for humanity will be profound.

Far from seeing the environment as the pillar of human history, sedentary societies, especially modern industrial societies, have acted under the illusion that they are somehow independent of the natural world, which they have generally preferred to see as something isolated. that they can exploit with greater or lesser impunity.

Since the first transition that began 10,000 years ago, and particularly since two centuries ago, humans have placed increasing pressure on the Earth's environment, challenging basic ecological principles. They have destroyed climax ecosystems to create agricultural land, causing environmental damage such as widespread soil erosion. Through a combination of hunting and farming they have driven individual animals to extinction and severely reduced the population of others. Either deliberately or accidentally, they have introduced new animals and plants that have altered ecosystems, often with unpredictable results. (The release of genetically engineered organisms would take the intervention process and the risk of negative consequences to a new level.) For two hundred years, human societies have become dependent on fossil fuel energy resources. A valuation system continues to operate that does not take into account the fact that these are irreplaceable values that are of vital interest to future generations. Waste from the industrial system has been dumped into the world's ecosystems, forgetting the fact that it is not possible to get rid of this waste in a closed system such as the Earth. The waste products generated by industry do not disappear once they are discharged into the environment. At best they are diluted, but more often the problem has simply been delayed or transferred, as in the case of CFCs that pollute the upper layers of the atmosphere. Industrial waste has polluted the atmosphere on an increasing scale and with increasing toxicity. The effects have also been felt over a wide area until the global mechanisms that make life on Earth possible - the ozone layer and the regulation of global temperatures - have been affected, a final reminder that the Earth is a system closed.

Environmental problems are not something new. However, with the expansion of Europe to dominate much of the globe, with the rapid growth of world population, the increase in cultivated area at the expense of natural ecosystems, and the emergence of highly industrialized societies, the scale of environmental problems has been increased and have a more complex nature. The world is currently facing a series of interrelated crises caused by past actions: deforestation, soil erosion, desertification, salinization, increased loss of fauna and flora, highly unequal distribution of food, wealth and basic human comforts, higher levels of pollution (noxious cocktails and new "chain reactions").

Another challenge facing modern societies is the dizzying speed of change. If this book were to give a balanced and chronologically accurate view of human history, most of its pages would have to deal with gathering and hunting communities, only a fraction of its content would concern agricultural and just a couple of lines to modern industrialized societies.

The fact that weakening has not occurred so far is no guarantee that it will not occur. Many societies of the past believed that they had a sustainable way of life, but some time later they realized that this was not the case and that they were unable to make the social, economic and political changes necessary for their survival. The problem of all human societies has been to find a way to extract food, clothing, shelter, and other goods from the environment in a way that does not render it incapable of sustaining them. Some damage is clearly unavoidable. Some predation is tolerable. The challenge has been to anticipate or recognize when the environment is being seriously degraded by the demands placed on it and to find the political, economic and social means to respond accordingly. Some societies have managed to find the right balance, while others have failed.

In this broader perspective, it is clearly too early to judge whether modern industrialized societies, with their very high rates of energy and resource consumption and high levels of pollution, and the rapidly increasing population of the rest of the world, can be sustained ecologically. Past human actions have left contemporary societies with a set of problems that are almost insurmountably difficult to solve.

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Presentation of "The energy limits of economic growth"

The interest of the following text lies in the fact that it clearly shows an obvious fact that is often overlooked by the vast majority of the current population (including most of those in charge of managing and promoting the maintenance and development of the techno-industrial system) clouded by the prevailing idealistic nonsense about "sustainable", "spiritual", "human" development, etc.: that development does not come out of nowhere, that it has a material base without which it cannot occur and that sets limits and conditions it. Without material resources and energy there is no worthwhile development, neither economic, nor technological, nor social. And these resources are limited and do not come out of nowhere. They necessarily imply the destruction and subjugation of Nature. Thus, one success of the text is that its authors recognize that technological development has a close direct relationship, not inverse, with the ecological impact (the so-called ecological footprint).

Unfortunately, the authors, despite recognizing this basic fact of the direct relationship between development and the use of resources (especially energy) and the ecological problems that it entails, do not question the need for such development, but rather, just as that most other human beings today (those who do not even take this relationship into account), consider it something good and indispensable, as can be seen in the fact that they do not seem to question at all whether the "quality of life" and "standard of living" (wealth) are necessarily the same. It seems that, for them, a high standard of living (i.e. having high purchasing power, access to developed health or educational services, fast means of transportation and remote communication, electronic devices, etc.) is synonymous of quality of life. Discussing the often vast differences between the notion of "quality of life" and "standard of living" and the frequent confusion between the two would require much more space than is available in this presentation. Here we will only briefly mention two typical examples of a high "standard of living" that do not necessarily correspond to a high "quality of life": if the population of a country has easy access to a well-developed health system advanced medical and pharmaceutical treatments, are we therefore to think that he is in good health? Or rather the opposite? After all, except for accidents or other relatively rare cases, medical treatments are usually for the sick, not the healthy. And the highly praised education, how has it improved the living conditions of the majority of the population? Has knowing how to read and having been forced to go to school for almost all of their childhood and youth helped the majority of the population to be more aware of reality, to be more

free, to be able to recognize the truth and not be deceived? , to be able to decide on the really important aspects of their lives or to be more satisfied with themselves? Or, in general, has it been quite the opposite and only or mainly has it helped most of them to find a job in an increasingly complex society that demands more and more technical qualifications from its members and so that Can they be better indoctrinated (for example, through reading) on how to be "good citizens", that is, useful members of the techno-industrial system who willingly collaborate in its maintenance? How many of them have used that education to try to improve their understanding of the world or to really be free? How many has it served? And how many of them use it rather to escape from reality and from themselves (for example, reading novels; or carrying out many other substitute activities - "hobbies" - that require a minimum preparation and cultural level)? How many of these are aware of such escapism and do not try to hide and justify it under pompous concepts such as "spiritual progress" or "artistic and intellectual elevation"? Who really and mainly serves the much overrated education? To the people or to the techno-industrial system? Or approached another way, if we take into account that an important part of the true quality of life should be being able to lead a life adjusted to our nature, that is, in close contact with an environment that is mostly non-artificial, not degraded or polluted, without Noise, low population density, and few, and generally mild, restrictions on our behavior by the social environment, we will see that the situation in which most human beings currently live is far from representing high quality. of life, and that moreover , often, the further away from it the greater the development of their societies, that is, the higher their standard of living.

The fundamental question is not whether or not it will be possible to continue with development, and with the consequent increase in the standard of living, given the existing material limits, but whether what really matters is saving and improving our standard of living (in other words, continuing with the development of the techno-industrial system) at the cost of continuing to irremediably destroy and subjugate Nature to extract the energy and resources necessary for it and also at the cost of further degrading our quality of life, or preserving what remains of Nature by rejecting development, even if this implies a (probably drastic) decline in the standard of living. Because it is clear that both things, increasing development and the standard of living and simultaneously avoiding the ecological impact and the quality of life, are not compatible. Soups and sipping can not be.

The energy limits of economic growth¹

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The human species has an interesting duality. On the one hand, *Homo sapiens* are just another species, subject to the same scientific laws as the rest of millions of animals, plants and microbes. On the other hand, human beings are unique. In all of Earth's history, no other species has achieved such ecological dominance or created socioeconomic systems of similar complexity. Due to this duality, human beings have been studied by both the natural sciences and the social sciences, although often from very different perspectives (Arrow *et al.* 2004).

In just a few thousand years the human population has colonized the entire world and has grown to nearly 7 billion. Currently, humans appropriate between 20% and 40% of the annual net terrestrial primary production and have transformed the planet's atmosphere, waters, land and biodiversity (Vitousek *et al.* 1997, Haberl *et al.* 2007). *For centuries, some have been wondering how long a finite planet can sustain near-exponential population and economic growth (eg, Malthus 1798, Ehrlich 1968, Meadows et al. 1972). Recent issues such as climate change, the global decline in the rate of population growth, the depletion of oil reserves and the consequent rise in oil prices, as well as the recent economic downturn have fueled renewed concern about whether they will be able to continue to hold previous long trajectories of population and economic growth (eg, Arrow et al. 2004). These serious questions fall within the field of study of the natural and social sciences - especially ecology and economics.*

This article integrates perspectives from physics, ecology, and economics with the analysis of extensive global data to show how the scientific laws that govern energy flows in the biosphere affect socioeconomic activity. Our purpose is neither to pit ecology against economics nor to predict future population and economic trends; rather, we use theoretical insights from thermodynamics, allometry, and metabolic ecology (McMahon and Bonner 1983, Schneider and Kay 1995, Brown *et al.* 2004) and empirical approaches from macroecology (Brown 1995) to document energetic constraints acting on human ecology that have important implications for modern humans.

The central role of energy

Economic growth and development require that energy and other resources be extracted from the environment to manufacture goods, provide services, and create capital. The central role of energy is confirmed by both theory and data.

¹ Translation by Último Reducto of "Energetic Limits to Economic Growth", published in *BioScience* vol. 61, no. 1, January 2011: 19-26. © 2011 American Institute of Biological Sciences. *N. from t.*

The key theoretical underpinnings come from the laws of thermodynamics: first, that energy can be neither created nor destroyed, and second, that when you change from one form of energy to another, part of the energy is lost as heat. ability to do work. Complex and highly organized systems, including human economies, are maintained in states far from thermodynamic equilibrium by continuous energy consumption and transformation (Soddy 1926, Odum 1971, Georgescu-Roegen 1977, Ruth 1993, Schneider and Kay 1995, Hall *et al.* 2001, Chen 2005, Smil 2008).

Empirically, the central role of energy in modern human economies is demonstrated by the relationship between energy use and economic growth (Shafiee and Topal 2008, Smil 2008, Payne 2010). Here, we have taken a macroecological perspective and quantified the statistical relationships between energy use and economic activity for 220 nations over 24 years, using data from the International Energy Agency (IEA; [<http://www.iea.org/stats/index.asp>][www.iea.org/stats/mdex.asp])² and the World Resources Institute (WRI; [<http://earthtrends.wri.org/index.php>][<http://earthtrends.wri.org/index.php>]).³ Per capita energy consumption for each country has been calculated as the sum of human biological metabolism plus energy obtained from all other sources. Individual biological metabolism has been estimated from daily caloric intake data for each country and converted to watts per individual. Energy use from all other sources, including fossil fuels and renewable energy sources, has been obtained from the IEA. To measure economic activity, we have used IRM data for gross domestic product (GDP),⁴ the market value of all goods and services produced within a country in a year (Mankiw 2006). Both energy use and GDP can be expressed in per capita amounts. Thus, GDP per capita can be thought of as an index of the average participation of individuals in the economy of their country, and energy use per capita as the energy required to sustain that level of economic activity.

Figure 1 shows the relationship between energy use and GDP represented with logarithmic axes, with each colored line indicating the trajectory for each country throughout the period 1980-2003. Regression to mean GDP, G^5 for mean energy consumption E for each country over the 24-year period, explains 76% of variation. The fitted regression describes the relationship of energy use per capita to GDP per capita as a power law: $E = 4.13 G^{0.76}$ (figure 1 ; see also Figure S1c in the *online* supplementary materials available at

[<http://www.jstor.org/stable/10.1525/bio.2011.61.1.7>][www.jstor.org/stable/10.1525/bio.2011.61.1.7]. The sublinear slope, 0.76, indicates that the rate of per capita energy consumption associated with greater economic activity increases less rapidly than GDP itself. Countries with larger economies take advantage of economies

² “International Energy Agency (IEA)” in the original. The link is not operational at present (2021). *N. from t.*

³ “World Resources Institute (WRI)” in the original. *N. from t.*

⁴ “Gross domestic product (GDP)” in the original. *N. from t.*

⁵ From “GDP”. It has been left as “G” instead of translating it to “P” (for GDP) to avoid confusion, because further down (Figure 3) another parameter appears with the name of “P”. *N. from t.*

of scale and new technologies to make more efficient per capita use of energy (Hoffert *et al.* 1998). For example, there is both a positive relationship and an economy of scale between economic growth and the amount of infrastructure that distributes energy resources, such as roads, gas and oil pipelines, or power lines (Easterly and Rebelo 1993). The relationship between energy use and GDP holds across countries spanning the entire spectrum of economic development, from the poorest to the richest countries, spanning two orders of magnitude in both energy use (100 to 10,000 watts) and wealth (\$500 to \$50,000).

A similar trend appears within countries over time. The vast majority of the nations we have analyzed (74%) increased both their energy use and GDP between 1980 and 2003 and exhibited positive correlations over the 24 years (mean slope = 0.59; 95% confidence interval). $r^2 = 0.45-0.72$, figure 2, see also figure S1 at [<http://www.jstor.org/stable/10.1525/bio.2011.61.1.7>][www.jstor.org/stable/10.1525/bio.2011.61.1.7]. Countries that stand out for their recent sustained development, such as China and India, show trajectories of continued increase in energy use. The patterns in figures 1 and 2 are consistent with the increase in energy use that has fueled socioeconomic development throughout history (Tainter 1988, Smil 2008). For example, between 1850 and 2000, while the global human population increased fivefold, energy use increased 20-fold and fossil fuel use increased more than 150-fold (Holdren 2008).

$$y = 4.06x^{0.76}, r^2 = 0.76$$

GDP per capita (in constant 2000 US dollars)

Figure 1. Relationship between per capita energy use and gross domestic product (GDP; in US dollars) of the countries between 1980 and 2003, represented with logarithmic axes. Note that the slope or exponent, 0.76 (with a 95% confidence interval = 0.69-0.82), is close to three-fourths, which is the canonical value of the exponent for the relationship between metabolic rate and body mass in animals. If GDP per capita is taken as the size of the economy of an average individual and energy use per capita as the rate of energy consumption required to maintain that economy, this relationship may not be coincidental. Total energy consumption per capita has been calculated as the caloric intake of humans (about 130 watts) plus energy derived from all other sources, including fossil fuels and renewables. The thin colored lines show the trends for each country between 1980 and 2003. The thick black line is a regression model fitted to the mean values for each nation during that period. GDP data from the World Resources Institute [<http://earthtrends.wri.org/index.php>][<http://earthtrends.wri.org/index.php>] . Total energy consumption data has been calculated from the sum of energy consumption from food (data from the World Resources Institute) and all other sources of energy consumed for other purposes, such as services, manufacturing and transport . Source: International Energy Agency data available at [<http://www.iea.org/stats/index.asp>][www.iea.org/stats/index.asp]. [6,7]

⁶ “National Public Radio” in the original. It refers to an American radio station. *N. of t.*

⁷ Original title: *The Vanishing face of Gaia*.

The relationship between energy use and GDP depicted in Figure 1 raises important questions. One is the considerable variation around the regression line: countries with similar GDPs per capita differ by more than an order of magnitude in energy consumption per capita. We have not quantitatively analyzed this residual variation, although it would be illuminating to do so. For example, several oil-exporting nations (eg, the United Arab Emirates, Bahrain, Tajikistan, and Azerbaijan) show consistent outliers, with high values for energy use relative to GDP. Our hypothesis is that much of this energy is used to extract oil, which is then exported to the industrialized nations where it is consumed. We also conjecture that in some of them, such as Iceland, Sweden, and Norway, large amounts of energy are used to heat homes and workplaces during the cold winters of these high latitudes.

Also, some of the variation in Figure 1 may be due to error or a lack of standardization in the ways that different countries have calculated their energy use and GDP. The data sources we have used (the IEA and the IRM), while probably the best available, have their limitations. The original data is provided by the countries themselves, and some of the abrupt and seemingly inexplicable changes in the trajectories in Figure 1 may simply reflect errors or changes in estimation methods for energy use, GDP, or both. However, one of the strengths of our macroecological approach (Brown 1995) is that the hundreds of data points distributed over a variation of several orders of magnitude mean that modest errors and other sources of uncontrolled noise in the data they do not cloud the strong signals manifested in the form of robust patterns within and between different countries over time.

Slope of the relationship between GDP and energy for each country

Figure 2. The distribution of the frequencies of the exponents (the slopes obtained from the graphs of logarithmic axes) of the trajectories of energy consumption per capita in function of gross domestic product (GDP) within countries over the time series from 1980 to 2003. The average slope is about 0.6, and almost all countries showed positive growth over the 24-year period. years. Source: Data from the World Resources Institute [<http://earthtrends.wri.org/index.php>][(<http://earthtrends.wri.org/index.php>)] and the International Energy Agency ([<http://www.iea.org/stats/index.asp>]).⁸

Another question raised is, which is the dependent variable and which is the independent? Is it energy use that sustains economic development or is it economic development that drives energy consumption? Financial and energy economists have used econometric techniques to analyze time series of energy consumption and economic growth within each country in an attempt to determine causal relationships, but have not reached a clear consensus about whether it is the energy use that drives

⁸ Again the statistical language can complicate the understanding of the graph. Here, the authors count for how many countries (frequency) the slope of the line that relates wealth to energy use for each country has a given value (they refer to this slope as slope or exponent). After ordering the results in a graph, it can be seen that in the vast majority of countries there is a positive relationship between wealth (or socioeconomic development) and energy use for the data used. *N. from t.*

economic growth or vice versa (see Mahadevan and Asafu-Adjaye 2007, Payne 2010). By analogy with biological allometry, we have represented per capita energy use as the dependent variable and per capita GDP as the independent variable; this is similar to plotting an animal's rate of energy use as a function of its body size. The exponent for the representation of energy use as a function of GDP, 0.76, is reminiscent of the three-quarter potential relationship between metabolic rate and body mass in animals (Kleiber 1961, McMahon and Bonner 1983). This may not be a coincidence. In a very real sense, both animals and economies have "metabolisms." Both consume, transform and distribute energy to keep complex adaptive systems away from thermodynamic equilibrium. The energy and other resources that sustain these systems are supplied by networks that branch out in a hierarchical fashion, such as blood vessels and lungs in mammals and oil pipelines, electrical grids, and transportation networks in nations. Models suggest that the three-quarter potential ratio optimizes resource allocation (West *et al.* 1997, Banavar *et al.* 2010).

Some may be concerned that the relationships shown in Figures 1 and 2 may be "just correlations" without necessarily implying any underlying mechanism or causality. We do not agree. Ultimately, all science is based on correlations - between dependent and independent variables, model predictions and empirical measurements, or experimental treatments and controls. Any mechanism or causation proceeds from logical inferences. We have inferred that energy limits economic activity through direct causal mechanisms. The evidence for this inference has been presented above and comes from three sources: (1) theory, that is, the application of the second law of thermodynamics to complex adaptive systems; (2) the data, that is, the strong relationship between energy use per capita and GDP per capita over both space (the world's 220 nations) and time (24 years); and (3) the analogy, that is, the similarity between biological metabolism and socioeconomic metabolism. We have found this last source to be especially convincing. Just as a body has a metabolism that burns food energy in order to survive and grow, the economy of a city or a nation has a metabolism that must burn fuel in order to sustain it and allow it to grow. Just as higher metabolic rates are required to maintain and grow larger, more complex bodies (Kleiber 1961, McMahon and Bonner 1983), so are higher rates of energy consumption required to maintain and grow larger, more developed economies. that bring higher levels of technological development and higher standards of living.

Quantitative relationships between energy use, GDP and other socioeconomic indicators

Some may worry that the relationships in figures 1 and 2 do not reflect what is "really important", which could be certain aspects of quality of life rather than GDP. However, almost all measures of economic activity and living standards show a strong

correlation with both GDP and energy use (figure 3; for additional variables, see figure S2 in the supplementary materials *online* available at [<http://www.jstor.org/stable/10.1525/bio.2011.61.1.7>][www.jstor.org/stable/10.1525/bio.2011.61.1.7]). These include measures of nutrition, education, health services, resource use, technology and innovation. These relationships are not surprising and are the result of mechanistic principles. Money and energy are required to train engineers, physicians, and university doctors; to produce vaccines, medicines and medical equipment; and to build and maintain roads, railways, airplanes, mobile phone and Internet networks, hospitals and research centers, parks and conservation areas, and modern buildings and cities. The ecological footprint, a measure of total resource consumption and waste production per capita, also increases with energy use and GDP (figure 3; Dietz *et al.* 2007). Figure 3 shows that it has not been possible to substantially increase socially desirable goods and services without simultaneously increasing the consumption of energy and other natural resources and without increasing the environmental impacts that currently constitute climate change, pollution, alteration of biogeochemical cycles and the reduction of biodiversity.

Figure 3. Variables reflecting socioeconomic status and standard of living show a strong correlation with per capita energy use (upper panels) and output gross interior per capita (GDP lower panels). The variables are measures of health and well-being (population growth rate, doctors per 100,000 inhabitants [doctors per 100k], life expectancy, infant mortality per 100,000 inhabitants [infant mortality per 100k], caloric intake [calories], national poverty [national poverty]), energy use (electricity in kilowatt hours [electricity], residential energy in kilograms of oil equivalent), resource consumption (meat, televisions per 1000 inhabitants [TVs per 1000], kilotonnes of aluminum [aluminum], kilograms of waste produced [waste]), contributions

intellectual and technological (Nobel prizes per million inhabitants [Nobel Prizes per million], patents), and ecological impacts (ecological footprint in hectares [ecological footprint]). All correlations (r) are significant ($P < 0.05$). Data sources available in the supplementary materials *online*

[<http://www.jstor.org/stable/10.1525/bio.2011.61.1.7>][(www.jstor.org/stable/10.1525/bio.2011.61.1.7)].

Energy implications for future economic growth

These empirical patterns, along with their theoretical underpinnings, raise the question of whether economic growth and associated increases in human population, resource use, technological development, and living standards can continue on their current trajectories (Grossman and Krueger 1995, Ausubel 1996). In figure 4 we have developed some quantitative scenarios. We want to warn the reader that they are not intended to be predictions of the future; rather, they are extrapolations of the power law relationship shown in Figure 1 to estimate the amount of energy that would be

required to sustain different population sizes and levels of global economic development. So, for example, raising the standard of living of today's world population to the standard of living in the United States would require increasing the rate of energy consumption almost five times, from 17 to 77 terawatts (1 terawatt = 10^{12} watts). Population growth must also be taken into account in any future scenario. Maintaining the projected world population of 9.5 billion by 2050 with an average standard of living equivalent to the standard of living for the current American way of life would require about 268 terawatts, 16 times current global energy consumption. Even maintaining this huge population at China's most modest standard of living would require 2.5 times more energy than is currently used (figure 4).

world average

Figure 4. *Current and projected global energy consumption based on alternative scenarios of population growth (2006, 2025 and 2050) and living standards*

(equivalent to the current ones in Uganda, China and the United States). The dashed line is the global terrestrial net primary productivity (NPP), 75 terawatts (Haberl et al. 2007). Data sources and calculation methods can be consulted

in the supplementary materials online

[<http://www.jstor.org/stable/10.1525/bio.2011.61.1.7>][(www.jstor.org/stable/10.1525/bio.2011.61.1.7)]

However, there are good reasons to think that such simple scenarios based on extrapolations of current population and economic trends might be inaccurate. Our calculations incorporate the economies of scale implicit in the non-linear relationship between energy use and GDP, but do not take into account many potentially important factors, such as that energy scarcity could induce efficiency gains; that technological innovations could increase energy supply; and that socioeconomic, demographic and behavioral changes could occur. In fact, the human global economic system is complex and is kept far from thermodynamic equilibrium by high rates of energy input and transformation. These types of systems show unpredictable nonlinear dynamics, making it almost impossible to make predictions for the distant future (Schneider and Kay 1995).

One thing is clear: if the relationships depicted in Figures 1 to 3 characterize the fundamental causal relationships between the rate of energy use, the level of economic activity, and the standard of living, then further economic growth and development will require some kind of combination of (a) an increase in energy supply, (b) a decrease in energy use per capita, and (c) a decrease in the human population. We will consider each of them separately.

Increased energy supply. The energy sources that can be used to sustain future economic growth consist of finite amounts of fossil fuels, along with nuclear power, renewables, and other proposed but unproven technologies. Fossil fuels supply 85% of humanity's energy needs today (figure 5), but in reality they constitute a fixed quantity in storage that is rapidly being depleted (Heinberg 2003, IEA 2008, Hall and Day 2009). At present, conventional nuclear energy contributes only about 6% of the world's en-

ergy; their fuel supplies are also finite, and concerns about their safety and the storage and disposal of their waste threaten their future development (Nel and Cooper 2009). The use of nuclear fusion, something that has been impossible to achieve for the last 50 years, could in theory generate enormous amounts of energy, but would very likely have large and unpredictable socio-economic and environmental consequences. Renewable energy sources such as solar, hydroelectric, wind, or tidal power are abundant, but the environmental impacts and the time, resources, and investments required to capture their energy limit their potential (Hall and Day 2009). Biofuels can be renewable, but ecological constraints and environmental impacts restrict their contribution (Fargione *et al.* 2008). More generally, most attempts to develop new energy sources face the economic problem of diminishing returns to energy and monetary investment (Hall *et al.* 1986, Tainter 1988, Allen *et al.* 2001, Tainter *et al.* 2003).

Decrease in energy use per capita. The Malthusian-Darwinian dynamics that have shaped the evolution of human behavior and demographics have created in individuals and societies powerful tendencies to exploit all resources and all available technologies in order to increase personal status, biological adaptation, and social wealth (Lotka 1922). Poor people migrate to cities and other countries to improve their opportunities. Citizens of developing countries such as China and India are usually dissatisfied with their situation and understandably want to live like people in the developed world. People in richer countries are reluctant to sacrifice economic growth - let alone their cars, electronics and organ transplants - so that people in poorer countries can have bicycles, personal computers and flu shots.

Biofuels 0.2% Geothermal 0.2% (0.03 TW) (0.03 TW)

Figure 5. *Energy sources currently consumed by the global human economy. Total annual consumption is approximately 15.9 terawatts (TW; 1 terawatt = 10^9 watts), of which around 85% comes from fossil fuels, 6% from nuclear power and the remaining 9% from electricity. solar, hydroelectric, wind and other renewable sources (BP 2009, RPER21 2009).*

Declining human population. With increasing standards of living and rates of energy use, parents tend to invest more resources in fewer children (Moses and Brown 2003). This trade-off between the number and quality of offspring contributes to demographic transitions, in which family size and population growth rate decrease with increasing economic development (Thompson 1929). The growth rate of the world population has decreased in the last decade, but only a few developed countries show zero or negative population growth (WRI, [<http://earthtrends.wri.org/index.php>] [<http://earthtrends.wri.org/index.php>]). The relationship between family size and per capita energy use suggests that an energy supply rate five times higher than the current one will be needed to achieve a level of socioeconomic development capable of stabilizing the human population without endangering the freedom of individuals. to have as many children as they choose (Moses and Brown 2003, DeLong *et al.* 2010).

⁹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

The bottom line is that a huge increase in energy supply will be required to meet the demands of projected population growth and lift the developing world out of poverty without jeopardizing current standards of living in more developed countries. And the prospects for substantially increasing energy supplies are uncertain. Furthermore, the non-linear and complex nature of the global economy raises the possibility that energy shortages could cause massive socio-economic disruption. Again, consider the analogy with biological metabolism: the gradual reduction of an individual's food supply first produces physiological adjustments, but then ends up causing death by starvation, long before the food supplies are completely exhausted.

Throughout history, mainstream economists have ignored warnings that resource scarcity could permanently limit economic growth. Many believe that the ability to make technological innovation meet the demand for resources is as much a law of human nature as the Malthusian-Darwinian dynamics that create such demand (Barro and Sala-i-Martin 2003, Durlauf *et al.* 2005, Mankiw 2006). However, there is no scientific support for this statement; it is either an article of faith or it is based on flawed statistical extrapolations of certain historical trends. The ruins of Mohenjo Daro, Mesopotamia, Egypt, Rome, the Mayans, Angkor, Easter Island, and many other complex civilizations offer incontrovertible evidence that innovation does not always prevent socioeconomic collapse (Tainter 1988, Diamond 2004).

Conclusions

We are by no means the first to write about the limits to growth and fundamental energy constraints that flow directly from the laws of thermodynamics and the principles of ecology. Beginning with Malthus (1798), both ecologists and economists have drawn attention to the essential dependence of economies on natural resources and have pointed out that the quasi-exponential growth of the human population and economy cannot be sustained indefinitely in a world of finite resources (for example, Soddy 1922, Odum 1971, Daly 1977, Georgescu-Roegen 1977, Cleveland *et al.* 1984, Costanza and Daly 1992, Hall *et al.* 2001, Arrow *et al.* 2004, Stern 2004, Nel and van Zyl 2010). Some ecological economists and some systems ecologists have made similar claims about the limitations of economic systems (eg, Odum 1971, Hall *et al.* 1986). However, these perspectives have not been incorporated into mainstream economic theory, practice, or pedagogy (for example, Barro and Sala-i-Martin 2003, Mankiw 2006), and have been dismissed in the consensus statements of influential ecologists (for example, Lubchenco *et al.* 1991, Palmer *et al.* 2004, SEA 2009) and sustainability scientists (for example, CNI 1999, Kates *et al.* 2001, CIC 2002, Kates and Parris 2003, Parris and Kates 2003, Clark 2007).

Our explicitly macroecological and metabolic approach uses new data and analysis to offer a quantitative, mechanistic, and practically relevant understanding of the energetic limits of economic growth. We hope that the evidence and interpretations

presented here will draw the attention of scientists, policy makers, world leaders, and the public to the central, though largely underappreciated, role of energy limits to economic growth.

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5. Texts criticizing civilization and the techno - industrial system .

Pseudorebelliousness and false criticism of today's technological society, based on its own values, are common nowadays. In this section there are texts that can help distinguish these ideas from a true critique of the industrial technological system, based on respect for wild Nature.

In addition, the study of current trends in techno-industrial society can help to better understand not only what complex societies have done so far with Wild Nature and humans, but also what is likely to happen in the near future of continue to develop these trends. -

- Declaration of Principles.
- The best trick of the system . By Theodore John Kaczynski.
- Is scientific work primarily motivated by a desire to do good for humanity? By Theodore John Kaczynski.
- Excerpt from Ted Kaczynski's letter to David Skrbina dated August 29, 2004. By Theodore John Kaczynski.
- Of how the Earth stopped being the first. by BR
- Excerpt from Ted Kaczynski's letter to David Skrbina dated September 18, 2004. By Theodore John Kaczynski.
- Limits to growth and the biodiversity crisis. By Eileen Christ.
- Technological development and the energy factor. by JC
- Stay on target. By Theodore John Kaczynski.
- The long-term consequences of geoengineering. By Theodore John Kaczynski.
- Population, opulence or technology? By Dave Foreman and Laura Carroll.
- Islands of civilization - A minority way of seeing things. By Roderick F. Nash and John Davis, respectively.
- Leftism. Finally Redoubt.
- Beyond the climate crisis. By Eileen Christ.
- The story of managed Earth. By David Ehrenfeld.
- Open letter to fellow ecologists. By Alex Budd.
- The great denial. By Sandy Irvine.
- Is green growth possible? By Jason Hickel and Giorgos Kallis.
- Darwin among the machines. By Cellarius (Samuel Butler).
- The myth of the environmental movement. By Dave Foreman.
- The limits of spiritual illumination, Two divergent paths and The decline of the integral world . By Tomislav Markus.
- The great turning point. By Tomislav Markus.
- The discourse on climate change and the end of the era of fossil fuels . By Tomislav Markus
- Leftism, techno-industrial system and Wild Nature. by Karacam
- Evolution, consequences and future of the domestication of plants and animals . By Jared Diamond

- Current demographics suggest that future energy supplies will be inadequate to slow human population growth. By John P. DeLong, Oskar Burger, and Marcus J. Hamilton
- When the shots go out the butt . By Michael Huesemann and Joyce Huesemann
- Possible reactions of the techno-industrial system to climate change . by Karacam
- How we make things worse . By Nicholas P. Money
- Progress versus wild nature . By Theodore John Kaczynski

Statement of Principles

The individuals who signed this declaration want to place on record for the future the principles that drive us to actively lay the groundwork for the establishment of a truly strong and effective movement against the techno-industrial system.

1. Our Principles.

The principles that guide our activity are:

1.1 ***Autonomy of the Wild.*** We understand “the Wild” (also “wild Nature”) to be everything that is not artificial and whose operation is autonomous. The Wild is the part of Nature that is untamed, that is not subject to the control and management of human beings (or of the technological systems built by them), even if human beings can be part of it. Therefore, we also consider as part of the Wild, human nature itself, i.e., the part of the mind and of human behaviour that is innate and the biological consequence of evolution by natural selection. The autonomy of the wild part of human beings is what we call “freedom.” Our position is that the autonomy of the Wild is the most important value to which all other values are subordinate. We consider bad (worthy of our rejection) everything that violates the autonomy of wild Nature. In consequence, this value is the fundamental principle from which we derive the rest of our ideology and which inspires our goals and activity.

1.2 ***Rejection of techno-industrial society and of civilization.*** Our fundamental principle being respect toward wild Nature, we consider bad all social systems that inevitably work against the above-mentioned autonomy. We consider that, at least, all forms of civilized society (i.e., with cities) are essentially contrary to this principle and therefore bad. And, out of all the forms of civilized society, we consider techno-industrial society (the social system whose technology is based on the combustion engine and electric power) especially harmful for the autonomy of the Wild, due to the fact that the enormous development of its technology affects many aspects of the functioning of wild Nature that before this society remained untamed, in addition to interfering to a greater degree with those aspects of the Wild whose dynamics were subjected to a lesser extent in other previous forms of society.

2. Our Ideal.

We also believe that a positive social ideal is necessary and useful to inspire our fight. The majority of people prefer to fight for a positive ideal in order to combat only a few negative facts. Our ideal is the nomadic hunter/gatherer way of life, since it is the form of human society that is least harmful to wild Nature and that best suits our nature.

3. Our Goal.

However, we do not believe that the conscious and planned implementation of an ideal social model can be achieved without the model being perverted and/or having serious and unforeseen negative consequences and this would be especially true in the case of the nomadic hunter/gatherer way of life. Therefore, although we consider desirable the disappearance of all forms of civilized society and even all forms of society apart from the nomadic hunter/gatherer way of life, we do not see any practical way by which this can be achieved.

However, these outlined principles suggest a clear goal: the complete destruction of the techno-industrial system. If the techno-industrial form of society is the form of society that most threatens the autonomy of the Wild, then this society must be eliminated. Therefore, a movement that is based on the above principles must have as its fundamental objective the end of techno-industrial society.

Unlike the end of civilization or of any other form of pre-industrial society different from the nomadic hunter/gatherer one, we believe that the objective of the definitive disappearance of techno-industrial society can be achieved if in the future there are certain material conditions (a great crisis, that is to say, a severe weakening of the techno-industrial system). In fact, we believe that it is likely that these material conditions will happen by themselves eventually.

4. Our Work.

The work of the movement must be:

4.1 The development and diffusion of an ideology based on the identified principles and goals.

4.2 The gathering and organizing of all appropriate individuals (see point 5) so that the movement can be strengthened and it can prepare to try to bring the techno-industrial system down permanently when it is in crisis.

4.3 The facilitation of the arrival of the crisis of the techno-industrial system, as far as possible.

5. Dangers to Avoid

So that the movement turns out to be truly effective and stays loyal to its principles and purpose, it is crucial to keep in mind that all social systems generate an ideology (a more or less coherent set of ideas and values) that justifies and promotes their maintenance and material development. So, it is also necessary to take into account that techno-industrial society cannot be effectively combated based on the values and ends of the same social system that is to be destroyed. To this end, it is very important to reject progressivism, humanism and leftism. Here is a brief explanation of each of them:

5.1 Of the various ideas that are fundamental parts of the ideology of industrial society, progress (the idea that the development of society is unquestionably good) is one of the most important. Progress implies the assumption that any shift to greater social complexity and size is a fundamental improvement for human beings, society and even the world. Progress means that the gradual development of human societies towards ever-increasing destruction and subjugation of wild Nature is a good thing. This is just the opposite of how we interpret this process. Progressivism is the attitude of assuming and defending progress.

5.2 Humanism is a set of ideas that exalts “the human,” considering it superior and alien to Nature. Humanism distorts or even despises the notion of human nature (besides wild Nature in general), generating a distorted image of our species that considers “human” (i.e., worthy of respect, good) only those traits, actions, and products of human beings that, not coincidentally, are best suited for the requirements of civilized life. Humanism considers “non-human” (bad and despicable) those traits, actions and products of human beings that do not comply with the requirements of civilized life. Humanism is, therefore, contrary to any ideology that takes the Wild as its fundamental value.

5.3 Leftism is a current, derived from humanism, that adjusts humanism to the demands of modern industrial society. The basic features of leftism are the defence of equality, of solidarity beyond the natural group of closest people, and an ideally harmonious society (without conflicts, without problems). Leftism is, if anything, the most dangerous of the three trends identified here, since, in addition to justifying the techno-industrial system by defending its fundamental ideas and values, it serves as the system’s self-defense mechanism due to its pseudo-rebellious character. The rebel image of leftist struggles attracts many people unsatisfied with techno-industrial society, and so channels their discontent, offering them a way to vent it in an innocuous or even useful manner to the techno-industrial system. And, vice versa, the people aligned with leftism often feel attracted to currents and movements that seem rebellious to them, absorbing, invading and ruining these movements by replacing, modifying or perverting movement’s principles and goals to fit their leftist beliefs.

It is for this reason that a movement against techno-industrial society that wants to be truly effective must pay special attention to maintaining a distance from all forms

of leftism, expressing clearly and unequivocally its disdain for them, and keeping away from other leftists and similar undesirable people (the impractical, the inefficient, the irrational, the unbalanced, etc.).

The rejection of all forms of progressivism, humanism and leftism, the attack on the values of the techno-industrial system and the dissemination of our ideas are requirements to ensure that the activity of our movement is truly effective, but it is important to always remember that these things are not the goal of our activity. The goal is, and must always be, to put an end to the techno-industrial system, which is neither only nor mainly an ideological system, but fundamentally a material one. It is not a question of substituting the ideology of the system with ours, but of ending its physical existence.

The best trick of the system¹

By Ted Kaczynski

“The technological society will be able to afford the supreme luxury of tolerating useless rebellion with an indulgent smile.” Jacques Ellul.²

The system is playing it to the presumed revolutionaries and rebels. The trick is so subtle that, had it been consciously planned, one would be forced to admire its almost mathematical elegance.

1. What the System is not.

Let's start by making it clear what the System is not. The System is not the president of a country and its advisers and delegates, nor the government, nor even the State of a country; It is not the police officers who mistreat those who protest; It is not the boards of directors of multinational corporations; and it is not the Frankensteins who, in their laboratories, illegitimately mess with the genes of living beings. All those people are nothing more than servants of the System, and they do not constitute the System in themselves. Furthermore, the personal and individual values, attitudes, beliefs and behaviors of any such person may be in significant conflict with the needs of the System.

To illustrate it with an example, the System requires respect for property rights and, even so, managers of large companies, policemen, scientists and politicians sometimes steal (by "stealing" we should not only understand the theft of objects We can also include all those illegal means of acquiring property, such as evading taxes, accepting bribes and any other form of fraud or corruption). But the fact that executives, police officers, scientists, and politicians sometimes steal does not mean that stealing is part of the System's workings. On the contrary, when a police officer or a politician steals something, they are rebelling against the respect for law and property that the System demands. However, even when they steal, these people remain servants of the System as they publicly continue to support law and property.

¹ Translation of "The System's Neatest Trick" by Último Reducto (UR from now on). © 2003 for the original text, Theodore John Kaczinsky. © 2005 for translation, Último Reducto. (*Translator's note*).

² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

Regardless of the illegal acts that may be committed by politicians, police officers or executives individually, theft, bribery and fraud are not inherent to the functioning of the System but are dysfunctions of the same. The fewer thefts, the better the System will work, and this is why the System's serfs and managers always promote obedience to the law, even when they sometimes find it convenient for themselves to break it in private.³⁴

Let's look at another example. Although the police are the protectors of the System, police brutality is not part of the proper functioning of the System. When cops beat up a suspect, they're not working for the good of the System, they're just venting their own anger and hostility. The goal of the System is not brutality or the expression of rage. As far as the task of the police is concerned, the purpose of the System is to ensure that its rules are obeyed and to achieve it with the minimum possible degree of disorder, violence and bad press. Thus, from the System's point of view, the ideal cop would be one who never got angry, never used more violence than necessary, and, whenever possible, kept people in check by manipulating rather than by force. strength. Police brutality is just another malfunction of the System, not something inherent in its proper functioning.

To prove it, let's look at the attitude of the media. The mainstream media almost unanimously condemns police brutality. Of course, the attitude of the mainstream media represents, as the norm in our society, the prevailing opinion among the powerful classes about what is good for the System.

What has just been said about theft, fraud and police brutality is also applicable to cases of discrimination and victimization such as racism, sexism, homophobia, poverty and labor exploitation. All of them are bad for the System. For example, the more discriminated against or excluded blacks feel, the more likely they are to turn to crime and not worry about studying careers that make them useful members of the System.

Modern technology, with rapid long-distance transportation and the disruption of traditional ways of life that characterize it, has led to the mixing of different populations, in such a way that today individuals of different races, nationalities, cultures and religions have to live and work together. When people hate or reject each other because of their race, ethnicity, religion, sexual preference, etc., the resulting conflicts interfere with the functioning of the System. Except for a few fossilized relics of the past, the managers of the System know all this very well and that is why they indoctrinate us in school and through the media so that we believe that racism, sexism, homophobia and the like are evils social to be eliminated.

³ A superficial reading of this part of "The Best Trick in the System" could lead it to be interpreted as a defense of theft as a supposedly revolutionary activity. Putting this to Kaczynski, his response was the following note:

⁴ A superficial reading of this part of "The Best Trick in the System" could lead it to be interpreted as a defense of theft as a supposedly revolutionary activity. Putting this to Kaczynski, his response was the following note:

Undoubtedly some of those managers of the System, some politicians, scientists and executives, in private, believe that the place of women is the kitchen, or that homosexuality and interracial marriage are disgusting. But even if most of them believed such things, that would not mean that racism, sexism and homophobia are part of the functioning of the System - just as theft by managers does not mean that stealing is part of the proper functioning of the System. System. And just as the System promotes respect for law and property in order to maintain its own safety, the System for the same reason needs to debunk and prevent racism and other forms of victimization. That is the reason why the System, despite some private deviations on the part of some members of the elite, has as one of its basic objectives the suppression of discrimination and victimization.

As proof of this, let us look again at the attitude of the mainstream media. Except for occasional timid dissent from a few more daring and reactionary commentators, media propaganda is overwhelmingly favorable to racial and gender equality and acceptance of homosexuality and interracial marriage.⁵

The System needs a population that is meek, non-violent, domesticated, docile and obedient. You need to avoid any conflict or disorder that might interfere with the orderly functioning of the social machine. In addition to suppressing racial, ethnic, religious and any other type of group hostility, he also needs to eliminate or manage for his own benefit any other tendency that causes disorder and disorder, such as machismo, aggressive impulses and any inclination to the violence.

Naturally, traditional racial and ethnic antagonisms are slow to fade; machismo, aggressiveness and violent impulses cannot be easily suppressed and attitudes in relation to sexual and gender identity cannot be generalized from one day to the next. Consequently, there are many individuals who resist these changes and the System faces the problem of breaking down their resistance.⁶

2. The way the System exploits the impulse to rebellion.

Everyone in modern society is caught in a dense web of rules and regulations. We are at the mercy of large organizations such as corporations, governments, unions, universities, churches, and political parties, and as a result, we are powerless. As a result of the servitude, powerlessness and other vexations that the System inflicts on us, there is a general feeling of frustration, which leads to an impulse to rebellion. And this is where the System performs its best trick: through a brilliant sleight of hand, it turns rebellion into something to its advantage.

⁵ Original title: *The Vanishing face of Gaia*.

⁶ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

Many people do not understand the roots of their own frustration and consequently their rebellion is misguided. They know they want to rebel, but they don't know what. Coincidentally, the System is able to placate their need to rebel by providing them with a list of prefabricated and stereotyped injustices against which they can rebel: racism, homophobia, women's issues, poverty, labor exploitation... the complete "kit" with all the hodgepodge of ridiculousness typical of the activist's manual.

A huge number of would-be rebels take the bait. By fighting racism, sexism, etc., all they do is work for the System. Instead of realizing and acknowledging it, they imagine that they are rebelling against the System. How could this happen?

First, fifty years ago the System still did not promote equality for blacks, women and homosexuals, so, then, the actions in favor of those causes were really a form of rebellion. Consequently, those causes came to be conventionally regarded as rebellious causes. And they have maintained that status to this day simply due to tradition, as each new generation of rebels imitates the previous one.

Second, as I have pointed out before, there is still a significant number of people who resist the social changes that the System requires. And some of these people even represent authority, such as some policemen, judges or politicians. These reactionaries are a target for would-be rebels, someone to rebel against. Certain celebrities help the success of this trick by ranting against activists: the fact that they have made someone angry reinforces the illusion of activists that they are rebelling.

Third, in order to conflict with even the majority of System managers who do fully accept the changes that the System demands, the would-be rebels insist on solutions that go beyond what those System managers consider prudent and show anger disproportionate to trivial matters. For example, they demand compensation for the victims of alleged injustices and often fly into a rage at any criticism directed at a minority group, no matter how prudent and reasonable.

In this way, the activists are able to maintain the illusion that they are rebelling against the System. But that illusion is absurd. Agitation against racism, sexism, homophobia and the like is no more a rebellion against the System than protesting fraud or corruption in politics. Those who fight against fraud and corruption are not rebelling but acting in favor of the System, they reinforce it: they help politicians to obey the rules of the System. And similarly, those who take action against racism, sexism and homophobia are also reinforcing the System: they help the System to suppress the racist, sexist and homophobic attitudes that deviate from its needs and cause problems for it.

But activists don't just act as System Enforcers. They also serve as lightning rods to protect the System by directing public discontent away from the System and its institutions. For example, there are several reasons why the System has been favored by women leaving their homes and by female employment. If, fifty years ago, the System, represented by the government or the media, had suddenly begun to spread propaganda campaigns in order to make it socially acceptable for women to focus their lives on promoting themselves in the workplace instead of staying at home, the natural

human resistance to change would have caused widespread public discontent. What really happened was that these changes were spearheaded by radical feminists, behind whom the System institutions timidly advanced while keeping a safe distance. The discontent of the more conservative members of society was directed mainly against the radical feminists rather than against the System and its institutions, because the changes promoted directly by the System seemed slow and moderate compared to the more radical solutions advocated by feminists, and even these relatively slow changes were seen as imposed on the System through pressure from radicals.

3. The best trick of the System.

So, in summary, the best trick of the System consists of the following:

a) For the sake of its own efficiency and security, the System needs to carry out deep and radical social changes to gradually adapt to the conditions resulting from technological progress.

b) The frustration due to the living conditions imposed by the System produces impulses of rebellion.

c) The impulses of rebellion are taken advantage of by the System in favor of the social changes that it requires; activists “revolt” against old and obsolete values that are no longer useful to the System and for new values that the System needs us to accept.

d) In this way, the impulses of rebellion, which otherwise could be dangerous for the System, find a form of expression that is not only not harmful to the System, but also useful to it.

e) Much of the discontent resulting from the imposition of social changes, instead of damaging the System and its institutions, is directed against the radicals who promote social changes.

Of course, this trick is not something previously planned by the System administrators, who are not even really aware that they are carrying it out. The way it all works is something like this:

In deciding what position to take on any issue, editors and owners of the mass media have to weigh, consciously or unconsciously, several factors. They have to consider how readers or viewers will react to what they print or broadcast about the issue, they have to consider how their advertisers, their peers in other media, and other powerful people will react, and they have to consider the effect that will have for the security of the System what they make public.

These practical considerations will usually outweigh any personal feelings these people may have about the issue at hand. The personal sentiments of mass media managers, their advertisers, and other powerful people are diverse. They can be liberal or conservative, religious or atheist. The only common characteristic that all the leaders present is their commitment to the System, to its security and to its power. Consequently, as

long as it is within the limits imposed by what the public is willing to accept, the main determinant of attitudes propagated by the media is a strong consensus in the views of media managers and other powerful people about what is good for the System.

Therefore, when an editor or other manager of the mass media has to decide what attitude to take regarding a movement or a cause, his first thought is to determine if what the movement implies is something good or bad for the System. They may try to convince themselves that their decision is based on moral, philosophical, or religious principles, but it is an obvious fact that in practice the security of the System takes precedence over any other factor in determining the attitudes of users. mass media.

For example, if the editor of a current affairs magazine assesses the militia movement[iii] he may or may not personally sympathize with some of its goals and principles, but he will also pay attention to the fact that there is a strong consensus among their advertisers and their colleagues in other media about the militia movement being potentially dangerous to the System and therefore should be discredited. Under such circumstances, that manager knows that it is in his magazine's interest to show a negative attitude towards the militia movement. And presumably, the negative attitude of the mass media is part of the reason why the militia movement has declined.⁷

When that same writer assesses radical feminism, he sees that some of its proposals would be dangerous to the System, but he also sees that feminism implies many things that are useful to the System. The participation of women in the business world and in technological fields increases the degree of integration of them and their families in the System. His skills are of great use to the System in business and technology matters. The feminist emphasis on ending domestic violence and rape also serves the needs of the System, since rape and battering, like other forms of violence, are dangerous to the System. And perhaps most importantly, the writer is aware of the fact that boring and uninspiring modern housework, as well as the social isolation of modern housewives, can generate serious frustration for many women; frustration that will cause problems for the System unless women are offered an outlet through professional careers in the world of business and technology.

Even if this writer is a male chauvinist who is personally more comfortable with women in a subordinate position, he knows that feminism, at least in its relatively moderate versions, is good for the System. He knows that his editorial position must be favorable to moderate feminism or else he will suffer the disapproval of his advertisers and other powerful people.

And this is the reason why the attitude of the mainstream media has been generally favorable to moderate feminism, varied, depending on the medium and the moment, towards radical feminism and markedly hostile towards the most extreme feminist positions.

⁷ Since few non-American readers will know what the militia movement is, and even if they are, their understanding of it may be distorted by perhaps coming from sensational and unreliable sources, UR asked Kaczynski to explain what he meant by "militia movement". This was his response:

Through this type of process, rebel movements that are dangerous to the System are subjected to negative propaganda, while rebel movements that are considered useful to the System receive moderate support from the media.

The unconscious absorption of media propaganda influences the supposed rebels, inciting them to “rebel” in ways that serve the interests of the System.

University intellectuals also play an important role in carrying out the trick of the System. Despite the fact that they love to present themselves as independent thinkers, intellectuals constitute (with some honorable exceptions) the most oversocialized⁸, most conformist, most docile and most domesticated social group in modern society today. As a result, his rebellious drive is particularly strong. But, since they are unable to think independently, real rebellion is impossible for them. Consequently, they are cousins who fall for the System’s trick, which allows them to irritate certain people and enjoy the illusion of rebelling without having challenged even the most basic values of the System.

Because they are teachers of young people, university intellectuals help the System to apply its trick to young people. And they do it by directing the rebellious impulses of young people towards innocuous, prefabricated and stereotyped objectives: racism, colonialism, women’s problems, etc. Young people who are not college students learn through the media, or through personal contact, about the “social justice” causes for which students are rebelling, and imitate those students. Thus, a youth culture develops in which there is a stereotyped mode of rebellion that spreads through imitation of others—just as hairstyles, dress, and other novelties spread through imitation.

4. The trick is not perfect.

Naturally, the System trick doesn’t work perfectly. Not all the positions adopted by the community of “activists” are compatible with the requirements of the System. Thus, some of the most important difficulties facing the System are related to the conflict between the two different types of propaganda that the System has to use, integration propaganda and agitation propaganda.⁹

⁸ Kaczynski uses the term “oversocialized” to refer to people who have so deeply assumed the moral code of their social environment that they are incapable not only of acting but even of thinking in a way that contravenes said code. See Freedom Club, *Industrial Society and Its Future*, Ediciones Isumatag, 2011, para 25. (T.N.).

⁹ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

Integration propaganda is the main mechanism of socialization¹⁰ in modern societies. It is propaganda designed to induce in people the attitudes, beliefs, values and habits that they need to acquire in order to become reliable and useful tools for the System. It teaches them to permanently repress or sublimate emotional impulses that are dangerous to the System. It focuses on long-term attitudes and deeply held, widely applicable values rather than on specific attitudes around specific, one-off issues.

The *propaganda of agitation* acts on people's emotions to get them to manifest certain attitudes or behaviors in specific and punctual situations. Instead of teaching people to suppress dangerous emotional impulses, it seeks to stimulate certain emotions to achieve well-defined and time-localized purposes.

The System needs an orderly, docile, cooperative, passive and dependent population. Above all, it requires a nonviolent population, since it requires the government to exercise a monopoly on the use of physical force. For this reason, integration propaganda has to teach us to be horrified, scared and dismayed by violence, so that we are not tempted to use it even when we are very angry. (When I use the term "violence" I am referring to physical attacks on human beings). More generally, integration propaganda has to instill in us soft and maudlin values that praise non-aggressiveness, interdependence and cooperation.

On the other hand, in certain contexts, the System itself finds it useful or essential to rely on aggressive and brutal methods to achieve its own goals. The most obvious example of such methods is war. In times of war the System relies on agitational propaganda: in order to win public approval of military actions, it plays on people's emotions to make them feel fear and anger in the face of an enemy, real or perceived.

In such a situation there is a conflict between the propaganda of integration and the propaganda of agitation. Those people in whom softer values and an aversion to violence have been most deeply implanted cannot easily be persuaded to approve of a bloody military operation.

And this is where the System hack kind of fails. Activists, who have been "rebeling" all along for the values of integration propaganda, continue to do so during times of war. They oppose the war not only because it is violent but also because it is "racist", "colonialist", "imperialist", etc., all of which is contrary to the weak and pusillanimous values instilled by integration propaganda.

The System's trick also fails when it comes to the treatment of animals. Inevitably, many people extend to animals the maudlin and violence-averse values that have been instilled in them about humans. They are horrified by the slaughter of animals for meat and other practices that harm animals, such as reducing chickens to mere egg-laying

¹⁰ "Psychologists use the term 'socialization' to designate the process by which children are instructed to think and act in ways that society requires. A person is said to be well socialized if he believes in the moral code of his society, obeys it, and is well adapted to being a functional element of that society. (Freedom Club, *The Industrial Society and Its Future*, paragraph 24). (T.N.). "[...] The socialization process is not limited to childhood. But I think that most of the socialization takes place in childhood [...]" (Excerpt from letter from Ted Kaczynski to UR dated 1-19-2010. Original in English).

machines by keeping them in tiny cages or using animals in scientific experiments. To a certain extent, the opposition to animal abuse resulting from these values can be useful for the System: since a vegan diet is more efficient, in terms of the use of resources, than a carnivorous diet is, veganism, if widely adopted, it would help alleviate the pressure on the Earth's limited resources by a growing human population. But the activists' insistence on ending the use of animals in scientific experiments is in open conflict with the needs of the System, since no effective substitute for animals as experimental material seems likely to be found in the immediate future.

Still, the fact that the System's trick occasionally fails does not prevent it from being, on the whole, a remarkably effective mechanism for deflecting rebellious impulses in favor of the System itself.

Admittedly, the trick described here is not the only determining factor in the direction that rebellious impulses take in our society. Many people today feel weak and powerless (because the truth is that the System really does make us weak and powerless) and consequently they obsessively identify with the victims, the weak and the oppressed. This is also another reason why victimizations such as racism, sexism, homophobia and neo-colonialism have become the typical issues raised by activists.

5. An example.

I have in front of me an anthropology textbook¹¹ in which I have found some good examples of the way in which university intellectuals help the System to carry out its trick by disguising as criticism of modern society what it is nothing more than conformity. The most sophisticated of all these examples is found on pages 132-136, where the author cites, "adapting" it in his own way, an article by Rhonda Kay Williamson, a hermaphrodite person (that is, a person who was born with physical characteristics of both sexes, male and female).

Williamson asserts that the American Indians not only accepted hermaphrodite people but especially appreciated them.¹² And she contrasts this attitude with that of Euro-Americans, which she identifies with the attitude that her own parents showed towards her.

Williamson's parents cruelly mistreated her. They despised her for her status as a hermaphrodite. They told her that she was "cursed and that she served the devil" and subjected her to extravagant religious rites to bring out the "demon" inside her. They even gave him handkerchiefs into which he had to "cough to expel the devil out of himself".

However, it is obviously ridiculous to equate all this with the modern Euro-American attitude. It might approximate the Euro-American attitude of 150 years ago, but to-

¹¹ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

¹² A couple of examples:

day almost any mainstream American educator, psychologist, or clergyman would be horrified to see such treatment applied to a hermaphrodite. The mass media would never dream of presenting such treatment in a favorable light.

Today's typical middle-class American may not accept hermaphroditic status the way Indians did, but few will not recognize that the way Williamson was treated is cruel.

Williamson's parents were obviously quirky people, religious cranks whose attitudes and beliefs were far removed from the System's values. Therefore, despite the fact that he claims to be criticizing modern Euro-American society, Williamson is really attacking only certain atypical minorities and certain cultural antiquities that have not yet adapted to the dominant values in the United States today.

Haviland, the author of the book, on page 12 presents cultural anthropology as iconoclastic, as something that challenges the values assumed by modern Western society. This is so profoundly untrue that it would be amusing if it weren't so pathetic. The mainstream in modern American anthropology is abjectly subservient to the values and beliefs of the System. When today's anthropologists seek to question the values of their society, usually all they question are values from the past - obsolete and outmoded values that today are no longer held by anyone except a few eccentrics and living relics who they have not kept pace with the cultural changes that the System demands of us.

Haviland's use of Williamson's article illustrates this very well and represents the general tone of his entire book. Haviland uses ethnographic facts to instill politically correct lessons in his readers, but he waters down or totally omits ethnographic facts that are politically incorrect. Thus, while he cites Williamson's case to extol the Indians' acceptance of hermaphrodites, he fails to mention, for example, that in many Indian tribes women who committed adultery had their noses cut off,¹³ while however such punishment was not inflicted on adulterous men; or that among the Crow Indians a warrior who received a blow from a stranger had to kill him immediately or else he would inevitably fall into disgrace in the eyes of his tribe;¹⁴ nor does Haviland mention the customary use of torture by the Indians of the Eastern United States.¹⁵ Of course,

¹³ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

¹⁴ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹⁵ "*The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now*

acts of this type represent violence, machismo and discrimination between the sexes, therefore they are incompatible with the current values of the System and tend to be censored for being politically incorrect.

However, I have no doubt that Haviland sincerely believes that anthropologists question the foundations of Western society. The capacity for self-deception of our intellectuals can easily reach such extremes.

In closing, I want to make it very clear that I am not suggesting that it is okay to amputate noses in the case of adultery, or that any other mistreatment of women should be tolerated, nor would I want to see anyone discriminated against or rejected for being a hermaphrodite or because of their race, , religion, sexual orientation, etc., etc., etc. But in our society today, fighting these problems means, at most, defending mere reforms. The best trick of the System consists in having managed to transform powerful impulses of rebellion, which otherwise could have taken a revolutionary direction, and put them at the service of these modest reforms.

[vi] Anthropology, in particular, and the social “sciences” in general, are not only strongly chained to the values of the System in the United States. This is a universal phenomenon today (and not just today; “political correctness” is something that varies in content according to time and place, but has always been there). The example given here by Kaczynski refers to an American book on anthropology. However, it is not necessary to look far to find similar or comparable examples in current Hispanic and European social “sciences”. (*T.N.*).

Grades:

1. Jacques Ellul, *The Technological Society*, John Wilkinson translation, published by Alfred A. Knopf, New York, 1964, page 427.¹⁶

2. Even the most cursory review of the mass media in modern industrialized countries, or even in countries that merely aspire to be modern, will confirm that the System is committed to eliminating discrimination based on race, religion, sex , sexual

it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (The Earth Runs Out , page 237).

¹⁶ The Spanish version of this quote that appears in this article is a loose adaptation of Wilkinson’s translation, which in turn translated it from Ellul’s French original. Although the forms do not coincide exactly, UR considers that he has respected the meaning of the original version. There is a Spanish edition of this book: *The Age of Technique*, although the translation of this quote given in that edition does not coincide with that of UR (*N. del T.*).

orientation, etc., etc., etc. It would be easy to find thousands of examples to illustrate this, but here we will cite just three, from three different countries.

- *United States*: “Public Displays of Affection”, *US News & World Report*, September 9, 2002, pages 42-43. This article is a good example of how propaganda works. In principle it is presented as presumably impartial or neutral in relation to homosexual unions, even granting a certain space to the points of view of those who oppose the public acceptance of homosexuality. But anyone who reads the article, which is actually clearly sympathetic to a gay couple, will get the impression that acceptance of homosexuality is desirable and, in the long run, inevitable. Particularly important is the photo of the homosexual couple in question: a pair of physically attractive individuals have been selected and photographed to make a good impression. No one with even the slightest understanding of how propaganda works can fail to notice that the article constitutes propaganda for the social acceptance of homosexuality. And keep in mind that *US News & World Report* is a center-right magazine.

- *Russia*: “Putin denounces intolerance”, *The Denver Post*, July 26, 2002, page 16 A. “MOSCOW -President Vladimir Putin forcefully denounced racial prejudice and religious on Thursday... ‘If we allow this chauvinistic seed of national or religious intolerance to develop, we will ruin the country, Putin remarked and this message was clearly repeated on Russian television Thursday night.’ Etc etc.

- *Mexico*: “Racism against indigenous people persists” [*sic*], *El Sol de México*, January 11, 2002, page 1/B. Caption: “Despite efforts to grant dignity to the indigenous people of our country, they continue to suffer discrimination...”¹⁷ The article reports on the attempts of the bishops of Mexico to combat discrimination and says the bishops want to “purify” indigenous customs to free women from their traditionally inferior status. *El Sol de México* has a reputation for being a centre-right newspaper.

Anyone who wanted to bother could multiply these examples a thousand times. The evidence that the System itself pursues the elimination of discrimination and victimization is so obvious and overwhelming that one cannot help but be amazed when radicals assume that fighting these evils is a form of rebellion. One cannot help but attribute this belief to a phenomenon well known to professional propagandists: people tend to ignore, to stop perceiving or remembering, information that conflicts with their ideology. See the interesting article “Propaganda”, in *The New Encyclopaedia Britannica*, Volume 26, *Macropaedia*, 15[th] edition, 1997, pages: 171-179, especially page 176.

3. In this section, I have said that the System is *not* some things, but I have not said what the System *is*. A friend has pointed out to me that this can leave readers a bit confused, so I have to clarify that for the purpose of this article it is not necessary to give a precise definition of what the System is. I can’t imagine any way to define

¹⁷ This fragment is the Spanish translation of the translation made by Kaczynski into English from the original in Spanish that appeared in *El Sol de México*. Therefore, the UR translation may not exactly match the Mexican original. (*T.N.*).

the System in one resounding sentence and I don't want to break the continuity of the article with a long, complicated and unnecessary digression about what the System is, so I will leave that question unanswered. I do not think that the fact that I do not answer it seriously impedes the understanding of what I want to express in this article.

4. a) The concepts of "propaganda of integration" and "propaganda of agitation" are commented on by Jacques Ellul in his book *Propaganda*.

b) In this article when I mention "integration propaganda" and "agitation propaganda" I rely on my memories of the book *Propaganda* by Jacques Ellul. But it may be that I remember wrong. It may be that what I call "integration propaganda" is correctly called "sociological propaganda".¹⁸

5. William A. Haviland, *Cultural Anthropology*, Ninth Edition, Harcourt Brace & Company, 1999.

6. I assume that this statement is accurate. It certainly reflects the attitude of the Navajo. See Gladys A. Reichard, *Navaho Religion: A Study of Symbolism*, Princeton University Press, 1990; page 141. The original of this book was recorded in 1950, well before American anthropology became a deeply politicized discipline, so I see no reason to assume that such information is biased.

7. This fact is well known. See, for example, Angie Debo, *Geronimo: The Man, His Time, His Place*¹⁹, University of Oklahoma Press, 1976, page 225; Thomas B. Marquis (interpreter), *Wooden Leg: A Warrior Who Fought Custer*, Bison Books, University of Nebraska Press, 1967, page 97; Stanley Vestal, *Sitting Bull, Champion of the Sioux: A Biography*, University of Oklahoma Press, 1989, page 6; *The New Encyclopaedia Britannica*, Vol. 13, *Macropaedia*, 15th edition, 1997, article "American Peoples, Native", page 380.

8. Osbourne Russell, *Journal of a Trapper*, Bison Books edition, page 147.

9. The use of torture by the Indians of the eastern United States is well known. See, for example, Clark Wissler, *Indians of the United States*²⁰, Revised Edition, Anchor Books, Random House, New York, 1989, pages 131, 140, 145, 165, 282; Joseph Campbell, *The Power of Myth*, Anchor Books, Random House, New York, 1988(?), page 135; *The New Encyclopaedia Britannica*, Vol. 13, *Macropaedia*, 15th Edition, 1997, article "American Peoples, Native", page 385; James A. Axtel, *The Invasion Within: The Contest of Cultures in Colonial North America*, Oxford University Press, 1985, unable to cite page.

10. [Added later and not indicated in the text]. In [...] "The Best Trick in the System" I referred to the "politicization" of American anthropology and strongly attacked politically correct anthropologists [...] My ideas about the politicization of anthropology were based on some how many books and articles I had read and in some materials that

¹⁸ Fragment added to this note based on a letter from the author to UR dated 6-5-2005. (T.N.).

¹⁹ There is an edition in Spanish: *Geronimo, The Apache: the man, his tribe, his land, his time*. Olañeta, 2002. (N. del T.).

²⁰ There is an edition in Spanish: *Los Indios de los Estados Unidos de América*, Paidós, 1993. (N. del T.).

a person who was studying anthropology had sent me. My opinions were in no way based on systematic data collection or detailed knowledge of the recent anthropological literature.

One of the Spaniards with whom I am in correspondence [...] pointed out that I had been unfair to the anthropologists and defended his arguments by sending me copies of articles that appeared in publications dedicated to anthropology; eg, Michael J. Shott, "On Recent Trends in the Anthropology of Foragers," *Man* (NS), Vol. 27, No. 4, December, 1992, pages 843-871; and Raymond Hames, "The Ecological Noble Savage Debate", *Annual Review of Anthropology*, Vol. 36, 2007, pages 177-190.

[My friend] was right. As he showed me, I had greatly underestimated the number of American anthropologists who had made a conscious effort to present the facts objectively and without ideological bias. But even if my view about the politicization of anthropology were exaggerated, it would still be largely true. First *there are* some anthropologists whose work is highly politicized (I have already commented on the case of Haviland [for example]). Second, some of the debates among anthropologists appear to be clearly politically motivated, even though the participants in such debates certainly strive to be honest and objective. Consider, for example, the aforementioned article by Raymond Hames, which reviews the anthropological controversy about whether or not primitive peoples were good conservationists. Why does this question provoke so much debate among anthropologists? The reason, obviously, is that today the problem of controlling the environmental damage caused by industrial society is a hot political topic. Some anthropologists are tempted to present primitive peoples as moral examples from which we should learn to treat our environment with respect; other anthropologists might prefer to use primitives as negative examples to convince us that we should rely on modern methods to regulate our environment.

Until about the middle of the 20th century, our society displayed an exaggerated self-confidence. Except for a few dissenting voices, everyone assumed that "progress" was leading us to a better and brighter future. Even the most rebellious members of society - the Marxists - believed that the injustices of capitalism represented only a transitory phase that we had to go through to arrive at a world in which we would all share the benefits of "progress" equally. Since the superiority of modern society was taken for granted, it rarely occurred to anyone to draw comparisons between this society and primitive ones, either to praise modernity or to denigrate it.

But, since the middle of the 20th century, our society has been losing its self-confidence. Thoughtful people are increasingly affected by doubts about whether we are on the right path and this has led many to question the value of modernity and react against it by idealizing primitive societies. Other people, whose sense of security is threatened by attacks on modernity, react defensively and exaggerate the unattractive features of primitive cultures while denying or obviating their more attractive features.

This is why some issues that were once purely academic are now highly politically charged.²¹

²¹ This note is the translation of a fragment of a draft of the text “Afterthoughts” sent by the author to UR on 2-9-09 (the text “Afterthoughts” appears published in the book by Ted Kaczynski, *Technological Slavery*, Feral House, 2010, pages 415-423). Original in English. (*T.N.*).

IS SCIENTIFIC WORK MOTIVATED PRIMARILY BY A DESIRE TO DO GOOD FOR HUMANITY? [Yo]

You, in your comments on paragraphs 87-92 of *Industrial Society and Its Future*, write:

“The Motives of the Scientists. This section is especially weak for me...

“A long explanation of why Mr. Teller¹] is a Bad Man. Which is right. But when we think of physicists, most of us think of Einstein before Teller, and Einstein is a paradigmatic example of someone who completely contradicts that statement—but by no means the only one. [What statement? The claim that scientific endeavor is not primarily motivated by a desire to benefit mankind?].

“[Kaczynski] essentially denies that scientists have moral concerns.

“Speaking to people who I think have worked in what I consider to be genuinely negative fields of research—weapons design at Lawrence Livermore, for example—I have found that those who lead and are actively involved in that work are doing so because they believe that they are doing the right thing for the country, even with all the risks that their job entails, and that by doing the right thing for the country, they are doing the right thing for the world. Those people are aware of the moral implications of the decisions they actively make—in a direction I wouldn’t.

“The people who don’t seem to want to do that [don’t want to do what?] are brilliant people who, rather than direct the work, just maintain it. They see employment in that field as ethically neutral, merely legal work, and they don’t like to think about the costs and benefits of their work.”

First of all, let’s keep this in mind: it should have been clear that, in paragraphs 87-89 of *Industrial Society and Its Future*, I was discussing the *usual* reasons or *typical* of scientists; he wasn’t taking into account the occasional exceptions. So even if you could prove that 1%, or even 5%, of scientists are really motivated by a desire to do good for humanity, that would not seriously affect my argument. It should also have

¹ Excerpt from letter from Ted Kaczynski to PB dated May 16, 2009. Accessed September 8, 2009 and October 27, 2009. © 2009, Theodore John Kaczynski. © of the translation, 2013, Último Reducto. N. T.

been clear that when asking about the motives of scientists, he was asking about their motives *for doing scientific work*, not their motives for acting in other fields. I have never said that most scientists are not concerned with moral issues. It is one thing to say that a scientist is concerned with moral issues, and quite another to say that his main motive for conducting scientific research is the desire to do good for mankind. (Nevertheless, many examples of amorality can be found among scientists, as I will point out below.)

Thus, the argument that scientists (with a few exceptions) are not primarily motivated by a desire to benefit humanity does not deny that scientists have moral concerns—outside the laboratory. You mention Einstein. Einstein worked assiduously for world peace, and his motives for doing so were undoubtedly deeply moral. But that has nothing to do with his motives for doing research in the field of physics.

What you are supposedly saying is that scientists routinely act as moral agents *in carrying out their work*. Back in 2002, I discussed his theory with the two psychologists in this prison, competent men, in my opinion, who consider themselves to be "recalcitrant rationalists" and disdain dubious theories such as Freudianism. I quote part of my notes dated April 9, 2002:

"Since I am planning to reply to a letter I received some time ago from one PB, when Drs. Watterson and Morrison passed my cell today, I asked them...whether they had chosen the field of psychology for their own personal needs. either. to do good to the human race. Both replied that they had become psychologists to meet their own personal needs. So I asked them if they thought that most psychologists chose that profession for. to do good for the human race, or to satisfy their own personal needs. Both Dr. Watterson and Dr. Morrison said that most psychologists chose their profession to meet their own personal needs (especially ego needs,' Watterson said) and not to do good for the human race. Morrison added that many psychologists will *say* that they became psychologists to help people, but that's not their real motive. I commented to Watterson and Morrison on PB's view that scientists were 'concerned with moral issues'. Watterson and Morrison seemed to find this amusing. Morrison suggested, half jokingly, that I should write to PB. [and] give him the short answer: 'Wake up!'"

In order to support your argument, you say that you have "discovered" that the people who "lead and are actively involved in" military weapons design think they are doing the right thing for the world and are "taking into account the implications morals of the decisions they actively make. But how did you "discover" that? For the mere fact that they themselves told him so? His ingenuity is astonishing. If these people thought your work was harmful, do you think they would admit it to you? If a man is unscrupulous enough to do harmful work in order to satisfy his personal needs, surely he is equally unscrupulous to lie about his motivations.

There are people whose opinions about scientists involved in military research are very different from yours. In his self-incriminating post-war memoirs, Hitler's armament minister wrote:

"I exploited the phenomenon of dedication, often blind, of technicians to their task. Due to what appears to be the moral neutrality of technology, these people lacked any scruples about their activities. The more technical the world that war imposed on us, the more dangerous was the indifference of the technicians to the consequences of their anonymous activities."²

Do you think any of these technicians would have openly admitted to outsiders that they were indifferent to the consequences of their work? It is very unlikely. A notable case is that of Wernher von Braun. As you probably know, von Braun was the chief rocket scientist under Hitler and led the creation of the V-2 rocket, which killed scores of civilians in London and other cities.³ Von Braun claimed after the war that his motives had been "patriotic."⁴ But while he was working for Hitler, von Braun must have known that the Jews were being exterminated, since this was an "open secret in Germany since at least the end of 1942", according to the most recent studies.⁵ What kind of patriotism would lead a man to build weapons for a regime that exterminates entire ethnic groups out of sheer hatred? It is clear enough that "patriotism" was a mere excuse for von Braun, and that what he really wanted was to build rockets for the sake of building them.

"As World War II drew to a close in early 1945, Braun and many of his associates decided to surrender to the United States, where they believed they would find support for their rocketry research..."⁵

The point here is not whether building weapons for Hitler is morally equivalent to building weapons for a supposedly democratic regime like the United States. The important thing is that scientists often ascribe to themselves seemingly noble motivations, such as "patriotism," which don't necessarily have anything to do with their real motivations.

And, no, this way of acting is not limited to those who build weapons for dictatorial regimes. As you probably already know, J. Robert Oppenheimer led the development of the United States' first atomic bomb. In a November 2, 1945 speech to scientists who had participated in the bomb project at Los Alamos, New Mexico,⁶ Oppenheimer noted: "One always has to worry that what people say about their motivations are not adequate. Oppenheimer then laid out the usual excuses scientists gave for working

² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

³ Original title: *The Vanishing face of Gaia.*

⁴ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁵ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁶ A couple of examples:

on the bomb: the Nazis could have gotten the bomb first; there is no other place in the world where the development of atomic weapons would have been less likely to lead to disaster than in the United States; the real importance of atomic energy was not in the weapons but in the benefits that said energy could bring to humanity; etc. Oppenheimer pointed out that all these justifications were more or less valid, but he insisted that the real reason why the scientists had developed the bomb was that, for them, their work was a personal need, an “organic need”. Scientists, in Oppenheimer’s view, lived by a philosophy that the acquisition and dissemination of knowledge were ends in themselves, regardless of whether they brought practical benefit to the human race.

The implications of Oppenheimer’s speech are obvious, even if Oppenheimer did not make them clear: scientists do not work for the good of humanity, but to satisfy their own needs. Although Oppenheimer probably believed that science generally benefited humanity, he recognized that justifying science by saying that it benefits humanity was essentially an excuse that did not represent the real motives of scientists.

It is significant that the printed version of that speech found among Oppenheimer’s papers had the following note: “This material is not to be made public. A revised version will probably appear soon in a scientific journal.”⁷ But, in fact, it appears that the speech was not published, in “revised” form or otherwise, before Smith and Weiner included it in their book.⁸

Apparently, Oppenheimer was not very comfortable with what he himself had to say about the motives of scientists. But some scientists have stated their motives more openly than Oppenheimer and without showing any sign of disgust.

⁷ For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

Werner von Siemens was a 19th century electrical engineer who invented the self-exciting generator and made other important discoveries in the field of electricity.⁹ In a letter dated December 25, 1887, Siemens sets out his reasons:

“Certainly, I have sought to obtain wealth and economic benefits, but not primarily to enjoy them; rather to obtain the means for the *execution of other plans and projects*, and, through my success, to achieve recognition of the appropriateness of my procedures and the usefulness of my work. Therefore, from my youth, I have yearned to establish an international company like that of the Fuggers¹⁰, which would guarantee, not only to me but also to my successors, power and esteem throughout the world, as well as the means to raise the standard of living for my sisters and other close relatives.

“I view our business only secondarily as a source of wealth; for me it is more a kingdom that I have founded and that I hope to leave intact to my successors so that they continue to develop a *creative work*”.¹¹ (*Italics are mine*).

Not a word about the good of humanity. But notice the importance Siemens places, *by itself*, on the execution of “plans”, “projects” and “creative work”. That is, to substitute activities. See *Industrial Society and Its Future*, paragraphs 38-41, 84, 87-89.

Surely, however, scientists working in fields whose purpose is obviously humanitarian, such as finding treatments for disease, are motivated by the desire to do good for humanity, aren’t they? In certain cases, perhaps. But, in general, I think not. The bacteriologist Hans Zinsser wrote:

“Never having any close relationship with those who work in the field of infectious diseases, he shared the false belief that these peculiar people were motivated by noble motives. And, not understanding too much how someone could act driven by noble motives, he asked us: ‘How does someone decide to be a bacteriologist?’... In reality,

⁹ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out*, page 237).

¹⁰ Important German banking and merchant family. *N. of the T.*

¹¹ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

men choose this branch of research for various reasons, of which the conscious desire of doing good is the least important. What matters is that it is one of the few remaining challenges for those individuals who feel the need to experience some degree of excitement. The fight against infectious diseases is one of the few genuine adventures left in the world. About the only real challenge that remains after the relentless domestication of the human species in its day off is war against these ferocious little creatures.”¹²

You mention Einstein as an example of someone whose scientific work was motivated by a desire to do good for humanity, but I think you are wrong. According to Gordon A. Craig, Einstein once said: “All our extolled technological progress, and civilization in general, could be compared to an ax in the hand of a pathological criminal.”¹³ Craig does not mention the source of his quote, so I have no way of checking its accuracy.¹⁴ But if the words quoted reflect Einstein’s view of technology, then it is hard to imagine any altruistic motive for the citation. Einstein’s scientific work. Einstein continued his work in theoretical physics to a very old age.¹⁵ He must have been aware that any advance in physics would surely have practical applications and, therefore, would reinforce that technology that he compared to “an ax in the hand of a pathological criminal.” So why did you continue your work? Maybe it was some kind of compulsion. Towards the end of his life, Einstein wrote: “I cannot keep away from my work. It has me inexorably trapped.”¹⁶

Whether it was a compulsion or not, Einstein’s scientific work had nothing to do with any desire to do good for the human race. In an autobiography¹⁷ that he wrote at the age of 67, Einstein described his reasons for pursuing science. Already as a small

¹² For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

¹³ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹⁴ The author later obtained the data of the original used by Craig: “Letter from Einstein to Heinrich Zangger, dated 6 Dec. 1917”. In *Collected Papers of Albert Einstein*, vol. 8A, pages 561-562 (in German). Princeton University Press (1987), J. Stachel, editor. And the original quote in German would be: “*Unser ganzer gepriesene Fortschritt der Technik, überhaupt der Civilisation, ist der Axt in der Hand des pathologischen Verbrechers vergleichbar*”. *N. of the T.*

¹⁵ Examples:

¹⁶ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁷ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

child he was oppressed by the feeling that hoping and striving for things was something “empty” or “meaningless” (*Nichtigkeit*). This suggests a depressive and defeatist mentality. Moreover, it seems that Einstein was too delicate a child to face the day-to-day world, since he discovered at an early age what he called the “cruelty” of having to dedicate efforts (*Treiben*) to earn a living. At first he tried to escape these painful feelings by becoming deeply religious, but at the age of twelve he lost his faith as a result of reading scientific books that refuted the Bible stories. So, he sought solace in science itself, which provided him with a “paradise” that replaced the religious paradise he had lost.¹⁸

Therefore, it seems that, in Einstein’s case, scientific work was not only a substitute activity, but also a way of escaping from a world that he found too harsh. In any case, the truth is that Einstein dedicated himself to science only to satisfy his personal needs; nowhere in his autobiography did he suggest that his research could improve the lot of the human race in any way.

I suppose that for every scientist I can cite whose stated motivation is to satisfy personal needs, you can cite many who claim to have altruistic motives. Altruistic motives are certainly not impossible. For example, I suppose that most field students in botany and zoology are motivated in part by a genuine love of wild plants and animals. In any case, statements of altruistic motives—or, to put it more accurately, of motives that are considered admirable by the standards of today’s society—are generally to be accorded very little value. While a scientist who admits that his motives are selfish risks lowering himself in the eyes of the people around him, one who claims to have a “noble” motive satisfies the expectations of other people and secures approval of it, when not his admiration. It is an obvious fact that most people, most of the time, will say what they think will earn them the approval of their peers. To be sure, this sometimes amounts to conscious dishonesty, as was the case with von Braun when he claimed his motives were “patriotic.” However, I think that, more often than not, scientists make up their own excuses. Science has its own self-serving ideology, and one of the functions of ideology is to justify the believer to himself. As the sociologist Monnerot explains, ideology “offers a *different version* of the relationship between the motive and what it motivates. The materials that make up an ideology, and that it organizes, can see the light of day, so to speak. They are not only permissible, but honorable, and they constantly seek to assert their relation to recognized social values... The aspirations of [the believer] are translated into ethical and social terms by ideology.”

But the ideology that presents science as a humanitarian enterprise is belied by the everyday conversations and behavior of scientists. In my eleven years as a student and professor of mathematics, during which I also took a few courses in physics and physical anthropology, I never heard any professor or student mention the effect on society of

¹⁸ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

scientific or mathematical work, or the benefit that said work allegedly provided for humanity. You refer to my “isolation even. academically,” so I am forced to explain to him that media claims about me have often been exaggerated to caricature and beyond, if not outright false. It is true that I was a loner, but not so much that I couldn’t hear or have many conversations with other students and math teachers. We teachers and students talked about what was going on in various fields of mathematics, about what kinds of research were being done and who was doing it, and about the actions and personalities of certain mathematicians, but never¹⁹ I heard no one express the slightest interest in what benefits their work might bring to the human race.

A less childish version of scientific ideology presents science not as a humanitarian enterprise, but as something “morally neutral”: scientists simply make certain tools available to society, and if negative consequences result, it is the fault of society. Society for having made “misuse” of them; the scientists’ hands are thus clean. One is reminded of the Gospel of Saint Matthew, 27, 24: “... he took water and washed his hands in front of the crowd, saying: I am innocent...” (Pontius Pilate). The *Encyclopaedia Britannica* uses this “neutrality” argument in its article on technology;²⁰ you, Dr. B., mention the same argument in the part of your letter that I quoted earlier; Albert Speer mentioned it when referring to the excuse given by the technicians who created weapons for Hitler (see above); von Braun similarly “stressed the intrinsic impartiality of scientific inquiry, which itself lacks moral dimensions until its products are used by society as a whole.”²¹

Of course technology *in the abstract* is morally neutral. But von Braun was not developing rockets on the abstract ground of Plato’s Ideal Forms. He was building rockets for Adolf Hitler and he knew very well that those rockets would be used to defend a regime that was carrying out mass exterminations. As neutral as technology may be in the abstract, when someone develops a new technology or discovers a scientific principle that has technological applications, they are taking a concrete action that has a concrete effect on the society in which they live. That person has no right to deny responsibility for that effect on the grounds that society *could* have used that technology in some other way—just as von Braun had no right to deny responsibility for the effects of his actions. rockets on the basis that Hitler could have used them only for space exploration and not as weapons. Von Braun was forced to ask himself

¹⁹ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

²⁰ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²¹ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

not just what Hitler *could* do with rockets in theory, but what he would *do* with them in practice. Similarly, when someone develops a new technology today, they are forced to consider not what society could do, in theory, with that technology, but how that technology is likely to interact with society in practice.

Everything said in the previous paragraph is obvious and anyone smart enough to be a rocket scientist, physicist, or molecular biologist can figure it out in five minutes of honest reflection. The fact that so many scientists resort to the "moral neutrality" argument shows that they are either being dishonest with themselves or with others, or have simply never bothered to think seriously about the social and moral implications of their work. [twenty-one]

There are a few scientists who think seriously and sincerely about the consequences their work has on society. But his moral qualms don't significantly interfere with his investigation; they carry it out anyway and then ease their consciences by lecturing about the "ethical" use of their science, imposing certain limitations on their research, or avoiding work that is specifically geared towards weapons development.

Of course, your preaching and scruples are completely useless. The way in which science is applied in practice is not determined by the scientists but by the usefulness that science has for those who seek money or power.

Alfred Nobel was essentially a pacifist, but that didn't stop him from developing high explosives. He consoled himself with the hope "that the destructive powers of his inventions would help end wars."²² We already know how well this worked, right? As we have already seen, Einstein preached—ineffectively—about world peace, but he continued his research until virtually the end of his life, despite his views on technology. The Manhattan Project scientists *first* developed the atomic bomb and then preached—again ineffectively—about the need for an international agency to control atomic energy.²³ In his book, *Behavior Control*²⁴, Perry London showed that he had thought seriously about the implications of techniques that facilitated the manipulation of human behavior. He offered certain ethical ideas that he hoped would guide the use of such techniques, but his ethical ideas have had no practical effect. David Gelernter, in his book *Mirror Worlds*²⁵, expressed serious concerns about the effect that computing would have on society. However, Gelernter continued to promote technology, including computing,²⁶ and the concerns he expressed in *Mirror Worlds* did nothing to mitigate the consequences of the development of computing.

²² "Red pine" in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

²³ Page 114.

²⁴ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²⁵ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁶ "Sweat lodge" in the original. *N. from trans.*

An article in the *New York Times*²⁷ reports on an AAAI conference²⁸ that took place on February 25, 2009. The conference discussed the dangers posed by the development of artificial intelligence and, as possible remedies, the participating scientists raised the "limits to research", the confinement of some research in "high security laboratories" and a "commission" that should "shape advances and help the society to face the consequences" of artificial intelligence. To what extent this was a publicity stunt and to what extent these scientists really believed in it is difficult to discern, but in any case, the proposals were completely naive.

It is clear that the "limits" raised by the scientists were not aimed at stopping research in the field of artificial intelligence in general, but only in certain very specific areas that the scientists thought were especially sensitive. Said "limits" will not be maintained for long. If the scientists of the Manhattan Project had refused to work on weapons research, they would have delayed the appearance of nuclear weapons by only a few years because, once quantum theory had been developed and nuclear fission discovered, it was inevitable that someone, before or later, apply that knowledge to the manufacture of nuclear weapons. Similarly, since research in the field of artificial intelligence is going to continue, it is certain that someone, sooner or later (probably soon), will apply the technical knowledge developed to invade areas that the AAAI intends to declare "forbidden".

The "high security labs" will not be controlled by you or me, but by powerful organizations such as large companies or governments. Therefore, the confinement of certain investigations in high-security laboratories will only increase the already excessive concentration of power that exists in our society.

The "commission" that is supposed to "shape the breakthroughs and help society deal with the consequences" of artificial intelligence inspires me with fear and contempt, since the idea of what is good for human beings that have those individuals hardly exceeds the level of that of a four-year-old child. I shudder just thinking about what kind of world they would create if they could.

In practice, however, the "commission" will be no more successful than the groups of scientists that formed after 1945 in trying to get nuclear energy regulated "wisely" and used only for peaceful purposes. . In the long term, how artificial intelligence is developed and applied will be determined by the needs of the people who have power and who are trying to increase it.

* * *

Therefore, whatever the ethical criteria that any scientist professes, those criteria have at most a negligible effect on the development of science and technology as a whole. What I wrote in paragraph 92 of *Industrial Society and Its Future* was essentially correct: "science goes on blindly, without respect for the true welfare of the human race

²⁷ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

²⁸ Acronym for "Association for the Advancement of Artificial Intelligence". *N. T.*

or any other criteria, obeying only to the psychological needs of scientists as well as those of government administration officials and managers of large companies that provide funds for research.”

GRADES:

1. Albert Speer, *Inside the Third Reich*, translated by Richard and Clara Winston, Macmillan, New York, 1970, page 212.
2. See *The Week*, March 6, 2009, page 39.
3. *The New Encyclopaedia Britannica*, 15th Edition, 2003, Vol. 2, article “Braun, Wernher von”, page 485.
4. Benjamin Schwarz, “Co-Conspirators,” *The Atlantic*, May 2009, page 80.
5. *Encycl. Britannica*, 2003, Vol. 19, article “Exploration”, page 47.
6. For the full text of the speech, see Alice Kimball Smith and Charles Weiner (eds.), *Robert Oppenheimer: Letters and Recollections*, Stanford University Press, California, 1995, pp. 315-325.
7. *Ibid.*, pages 315 and 350, note 20.
8. *Ibid.*
9. See GA Zimmermann, *Das Neunzehnte Jahrhundert*, second half, second part, Milwaukee, 1902, pp. 439-442; *Encycl. Britannica*, 2003, Vol.10, article “Siemens, Werner von”, page 787.
10. Friedrich Klemm, *A History of Western Technology*, translated by Dorothea Waley Singer, MIT Press, 1964/1978, page 353.
11. Hans Zinsser, *Rats, Lice, and History*, near the end of Chapter I. I do not have a date of publication for this book, but it probably appeared in the 1930s.
12. “The End of the Golden Age,” *The New York Review of Books*, November 4, 1999, page 14.
13. *Encycl. Britannica*, 2003, Vol. 18, article “Einstein”, page 157.
14. *Ibid.*
15. Paul Arthur Schilpp (editor), *Albert Einstein: Philosopher-Scientist*, Open Court, La Salle, Illinois, Third Edition, 1970/1995, pages 1-94. This autobiography is printed in the original German with an English translation on alternate pages. I would advise the reader to read the German version if possible, as the English translation seems poor to me.
16. For this whole paragraph see *ibid.*, pages 2 and 4.
17. Jules Monnerot, *Sociology and Psychology of Communism*, translated by Jane Degras and Richard Rees, Beacon Press, Boston, 1960, pp. 136-140.
18. With one trivial exception that is not relevant in this case.
19. *Encycl. Britannica*, 2003, Vol. 28, article “Technology, The History of”, page 471.
20. *Ibid.*, Vol. 2, article “Braun, Wernher von”, page 485.
21. I have been told that in recent years some scientists or the public relations companies that serve them have been developing quite sophisticated arguments to try to justify the role of science in society; and I have no doubt that this is true.

But everything relevant that I have seen in the mass media, up to the summer of 2009, seems to indicate that most scientists' thinking about the social and moral implications of their work is still at a superficial level, or even childish. A study of official science propaganda, especially sophisticated propaganda directed at an intelligent audience, would be highly desirable and important, but such a study would be far beyond the scope of this letter; and, what's more, I lack the necessary knowledge to do so. The arguments of sophisticated propagandists probably reflect as little the thinking of the ordinary scientist as, say, the arguments of sophisticated political philosophers reflect the thinking of the common soldier who goes out on the battlefield to fight for democracy, for fascism, or for democracy. communism. At best, ordinary scientists and soldiers can mindlessly repeat the sophisticated arguments of propagandists to justify their actions to themselves or to others.

22. *Encycl. Britannica*, 2003, vol. 8, article "Nobel, Alfred Bernhard", page 738.

23. Smith and Weiner, *op. cit.*, pages 303 and 310.

24. Harper & Row, New York, 1969.

25. Oxford University Press, New York, 1991, pages 213-225.

26. See David Gelernter, "US faces technology crisis," *The Missoulian* (Missoula, Montana newspaper), February 24, 1992.

27. John Markoff, "Scientists Worry Machines May Outsmart Man," *The New York Times*, July 26, 2009.

EXCERPT FROM THE LETTER TO DAVID SKRBINA OF AUGUST 29, 2004

*By Ted Kaczynski*¹

I am quite sure that it will be impossible to control post-revolutionary conditions, but I think you are quite right in saying that a "positive social ideal" is necessary. However, the social ideal that I would propose is that of the nomadic hunter-gatherer society.

First, I would argue that for a revolutionary movement to be successful it *has* to be extremist. Jacques Ellul says somewhere that a revolution must assume as its ideal the opposite of what it intends to overthrow.[1559] Abel states that "for an ideology to serve as the basis for a movement that aspires to success, it must link the goal of the movement with the issue it deals with. The best way to achieve this is to design a plan in which the goals are the opposite of what is considered to be the cause of the problematic experiences." [1560] Trotsky wrote: "The different stages of a revolutionary process are certified by a change of parties in which the most extreme always supplants the least extreme..."² The nomadic hunter-gatherer society would perfectly fulfill this function as a social ideal because, as an example of human culture, it is at the opposite extreme of technological society.

Second, if someone takes the position that certain aspects of civilization should be safeguarded, for example the cultural achievements up to the 17th century, then they will be tempted to compromise when it comes to eliminating the techno-industrial system, with the possible or probable result of not being able to remove the system at all. If the system collapses, what will happen to the art museums with all their priceless paintings and sculptures? Or to the great libraries with their immense warehouses of books? Who will worry about works of art and books when there are no organizations large and wealthy enough to employ restorers and librarians, as well as police officers to prevent looting and vandalism? And what will happen to the educational system? Without an organized educational system, children will grow up uneducated

¹ Translation from the original English manuscript, by JH *Translator's note*.

² Leon Trotsky, *History of the Russian Revolution*, translated by Max Eastman, 1980, Vol. One, pages xviii-xix. [There is a Spanish edition: *History of the Russian Revolution*, Zero, 1974. N. of t.].

and perhaps illiterate. Obviously, anyone who feels that it is important to preserve human cultural achievements up to the 17th century will be very reluctant to accept a complete collapse of the system, and will therefore seek a compromise solution and not take the frankly extreme measures that are necessary to hit it. our society a blow that diverts it from its current course of development, a course that is determined by technology. Therefore, only those who are willing to dispense with the achievements of civilization can be effective revolutionaries.

Third, to most people, a hunter-gatherer existence will seem much more attractive than that offered by a pre-industrial civilization. Even today, many people enjoy hunting, fishing, and gathering wild fruits and nuts. I think few would enjoy such tasks as ploughing, hoeing, or threshing. And in civilized societies the majority of the population has generally been exploited in one way or another by upper classes: if there were no slaves or serfs, then there were often wage laborers or landless farmers subject to the domination of landlords. Pre-industrial civilized societies frequently suffered from disastrous epidemics and famines, and ordinary people often suffered from poor nutrition. By contrast, hunter-gatherers, except in the Far North, generally enjoyed good nutrition.³ Famines among them were probably rare.⁴ They were relatively unaffected by infectious diseases until many of these diseases were brought to them by more "advanced" peoples.⁵ Slavery and well-developed social hierarchies may have existed among *sedentary* hunter-gatherers, but (apart from the tendency to keep women subservient to men to a greater or lesser degree), hunting societies -nomadic foragers were typically (but not always) characterized by social equality[1565], and usually did not practice slavery (although I know of one exception: apparently some Cree Indians, who were probably hunter-gatherers, took slaves⁶).

Just in case you have read the anarcho-primitive writings that portray the hunter-gatherer lifestyle as a kind of politically correct Garden of Eden where no one ever had to work more than 3 hours a day, where men and women were equal and everything was love , cooperation and altruism, I have to say that these are nothing more than nonsense; and if you are interested, I will prove it with numerous anthropological citations. But even if we disregard the idealized version of the anarcho-primitivists and take a realistic look at the facts, nomadic hunter-gatherer societies are much more attractive than civilized pre-industrial societies. I imagine that your main objection to hunter-gatherer societies versus (say) Renaissance or late medieval European civiliza-

³ For example, Elizabeth Cashdan, "Hunters and Gatherers: Economic Behavior in Bands," in S. Plattner (Editor), *Economic Anthropology*, 1989, pp. 22-23. **[There is a Spanish edition: "Economic behavior in gangs", in Stuart Plattner (Ed.), *Economic Anthropology*, Alianza Editorial Mexicana, 1991.< /strong> N. of t.]**

⁴ "In all the well-documented examples, cases of penury [= starvation] can be attributed to the intervention of modern intruders." Carleton S. Coon, *The Hunting Peoples*, 1971, pp. 388-389.

⁵ I take it for granted that this is "common knowledge" among anthropologists. Anyway, I have little specific information about this topic. [...].

⁶ *Encyclopaedia Britannica*, 15th edition, 1997, Volume 10, article "Slave", page 873.

tion would be their relatively rather modest level of cultural achievement (in terms of art, music, literature, scholarship, etc.). But I seriously doubt that more than a small fraction of the population in modern industrial society cares much about that kind of cultural achievement.

Furthermore, the hunter-gatherer society has proved its charm as a social ideal: anarcho-primitivism seems to have gained widespread popularity. One can hardly imagine an equal success for a movement that takes as its ideal, for example, the society of the late Middle Ages. Of course, one has to question to what extent the success of anarcho-primitivism depends on its idealized portrayal of hunter-gatherer societies. My guess, or at least my hope, is that certain unpleasant aspects of hunter-gatherer societies (e.g., male dominance, or hard work) would displease leftists, neurotics, and layabouts, but that such societies, realistically portrayed, they would still be attractive to the class of people who might be effective revolutionaries.

I don't think a return to a worldwide hunting and gathering economy is really going to be a possible result of a collapse of industrial society. No ideology will persuade people to starve while they can feed themselves by cultivating the land, so agriculture will presumably be practiced wherever the land and climate are suitable for it. A return to hunting and gathering as the sole means of subsistence could only occur in regions unsuitable for agriculture, such as the subarctic, arid plains, or rugged mountains.

Some years ago, a little group of people tried to consolidate a movement against technoindustrial society and in favor of wild Nature. As one of its first activities, that group wrote a text titled *Declaration of Principles (Statement of Principles)*. According to that group, a movement that claims to oppose techno-industrial society in order to defend wild Nature, should take as its basis the ideological backgrounds exposed in that text. That group doesn't exist anymore but we think that the following writing is a good foundation on which to base for developing an ideology against techno-industrial society, and perhaps it can be useful for those who want to create a movement with these features in the future. This is the reason why we publish it here.

ON HOW THE EARTH CEASED TO BE THE FIRST. 'Earth First!' (1980-1990), some lessons to learn By BR¹

I do not love man less, but nature more
Lord Byron

1. Introduction

The Earth First! (Earth First!, EF! onwards) is very little known in Spain. It is not easy to find sources in Spanish where he is mentioned and, on most of the few occasions that he is mentioned, it is usually to criticize him for his radicalism, his alleged misanthropy or the violent nature of his actions. An exception to the above occurs in certain sectors of the left, especially among "radical" environmentalists and defenders of the so-called animal liberation but, even in those environments, what is known about EF! it basically boils down to his use of sabotage and direct action.

The intention of this text is to show the initial ideology of EF!, briefly review its first ten years of history, point out some of the mistakes it made, and try to extract some useful lessons from all of this for those of us who oppose the techno-industrial society. (STI hereinafter) and we defend an indomitable nature that is not controlled or managed by human societies.

Why EF!? Because her story is a good example of how, in a relatively short period of time, a movement with non-leftist values and objectives turned into a movement excessively concerned with social problems such as the oppression of women, the distribution of wealth , etc.

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

2. Origins and foundation

Later I will deal with the ideology and strategy of EF! in a little more detail, for the moment I will only point out its two main objectives. On the one hand, to help make mainstream² conservation groups more effective by making them appear more reasonable and moderate by comparison.³ On the other hand, use all necessary means to protect nature, regardless of the strategy of the majority conservation groups, political interests or legal limitations.

The United States brings together two important characteristics that favor the emergence of a movement like EF!. First, it still retains relatively large wilderness areas, and second, there is a cultural tradition that perceives the importance and value of wilderness.

The first characteristic implies that there is something to defend, a proximate "cause". The founders of EF! they valued wilderness areas, had experienced them first-hand, and were aware of how, little by little, they were disappearing in the face of the development of STI⁴. However, in a country where there are no wilderness areas, it is more difficult for A movement focused on defending them arises, not because some people in that country cannot value ecosystems that are little or not at all humanized, but because they will not have a tangible and close cause to defend and that attracts new members.

The second characteristic lays the foundations on which to strengthen an ideology. The founders of EF! they did not have to develop their ideas and values from scratch. The importance of wilderness has been present in the American cultural tradition since its inception.⁵ And already from the 19th century, various American authors, inspired by this tradition, had developed and deepened the ideas that defend the importance of nature,⁶ for example, John Muir in the second half of the 19th century or Aldo Leopold by the middle of the 20th century, his ideas were known, had been published, and were available to those who cared. In addition, some of these authors, or others inspired by their ideas, founded several conservation organizations that continue to exist and are large and influential today. It is in these organizations that most of the founders of EF!

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

Of the five founders of EF!,⁷ four came from conservation organizations: Dave Foreman and Bart Koehler had been with the Wilderness Society, Ron Kezar of the Sierra Club, and Howie Wolke of Friends of the Earth. Mike Roselle was the only one who did not come from the conservation movement, but from various leftist groups like the Yippies and the Zippies.⁸

What is it that led you to leave those organizations and found a new group? It seems that there were two important elements: the novel *The Monkey Wrench Gang*⁹ and the RARE II process.

The Monkey Wrench Gang is a novel by Edward Abbey, published in 1975, that tells the story of a small group of “eco-warriors” who decide to defend the wild ecosystems of the American Southwest using any means at their disposal. scope, including sabotage. In the 1970s, the use of sabotage for conservation purposes was already present in the US,¹⁰ although it was reduced to small groups and scattered individuals such as, for example, the Bolt Weevils, the Black Mesa Defense Fund, the Eco-Commando Force '70 or the group that Abbey was partially inspired by, the Eco-Raiders. It is likely that

⁷ For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out*, page 237).

¹⁰ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

the founders of EF! knew of the existence of some of these groups,¹¹ however, it seems that Abbey's novel served them, in part, as a reference to consider a different strategy from that of conventional conservation groups.

It is true that *The Monkey Wrench Gang* had some influence but, according to Wolke, not as much as is often claimed.¹² What, on the other hand, was decisive was RARE II.¹³

RARE II (acronym for 'Roadless Area Review and Evaluation II') was the second part of a study of roadless areas carried out by the US Forest Service, which began in 1977 and concluded in 1979. Its objective was to examine and evaluate the roadless territories under its jurisdiction to decide which should be protected and which could be opened up for industrial development (mining, logging, roads, etc.). Slightly more than 25 million hectares were examined, of which only 6 million were protected (with a few exceptions, most of them corresponded to ecologically unproductive mountainous areas¹⁴). In addition, Dave Foreman and Howie Wolke "thought there was another [7 million hectares] of roadless land in the West that hadn't even been included in the study, either because of poor mapping or bureaucratic cheating. Those territories would also remain open to development."¹⁵

Two things should be kept in mind: first, scale. What was at stake was an area of wild land equivalent to half of Spain, which represents more than half of the area currently included in the US National Wilderness Preservation System (which covers 5% of the US territory). Second, these territories were not small spaces surrounded by roads, but were generally quite large areas with little human influence.

For Foreman, the consequences of RARE II on wild territories "were devastating; they symbolized the inability of the traditional political system to deal with the ecolog-

¹¹ For example: "*In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*" (*Earth's Revenge*, page 166).

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

¹⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁵ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

ical crisis.”¹⁶ RARE II confirmed their impressions of large conservation organizations. In his view, these big organizations were too concerned with appearing moderate, with proving that “wildlife conservation is not at odds with gross national product and that clean air actually helps the economy”;¹⁷ they were too willing to make concessions in exchange for any breakthrough, however small. In addition, since the mid-1970s, the problem of professionalizing conservation groups has become increasingly apparent. Many of those who worked in them were not people who cared about nature, but technicians, “the people who were looking for work in the conservation groups were looking for a professional career, they had important university degrees (...), for them to work for the conservation groups was like working for government or industry”,¹⁸ the consequence “of that trend was to make conservation (...) more anthropocentric”.¹⁹ Convinced of their ineffectiveness, Foreman, Wolke, Koehler, and Kezar left their respective groups and, in April 1980, together with Roselle, founded their own movement.

They decided to call it Earth First! because it summed up “(...) succinctly the only thing we could all agree on: that in *any* decision, the first thing to take into account must be the health of the Earth or, as Aldo said Leopold, ‘something is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is incorrect when it tends to the contrary’.”²⁰ They also adopted as a slogan: “No compromise in defense of mother Earth” (No concessions in defense of mother Earth), which declared their position regarding the strategy.

¹⁶ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*]< em>, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁸ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

¹⁹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²⁰ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

3. Ideology

In September 1980, Foreman wrote the "Statement of Principles" of the new movement:

Wild nature has the right to exist on its own

All forms of life, from viruses to great whales, have the same inherent right to exist

Humanity is not more important than all other forms of life and has no legitimate right to dominate the Earth

Humanity, through overpopulation, anthropocentrism, industrialization, excessive energy consumption/resource extraction, state capitalism, paternal hierarchies, imperialism, pollution and destruction of natural areas, threatens the basic processes of Life on earth

All human decisions should consider the Earth first and humanity second.

The only true test of morality is whether or not an action, individual, social, or political, benefits the Earth.

Humanity will be happier, healthier, safer, and more comfortable in a society that recognizes true human nature and is in dynamic harmony with the biosphere as a whole.

Political concessions have no place in the defense of the Earth

The Earth is the Goddess and the true object of human worship²¹

This statement makes the basis of his ideology quite clear.²² For the majority of the initial members²³ of EF!, nature (understood mainly as the biosphere, that is, the set of interdependent and interrelated ecosystems of the Earth) was the most important thing and they gave it an intrinsic value - that is to say, a value independent of any perception, interest or recognition of it by a conscious being. According to them, the best way to defend it was to preserve as many wild territories in which evolution could run its course autonomously. In Foreman's words, wilderness "is the real world, the flow of life, the process of evolution, the repositories of three and a half billion years of shared travel,"²⁴ "they are the essence of everything." what we pursue (...). We are not an environmental group. Environmental groups care about environmental risks to human health, care about clean water and air for the benefit of people, and ask us why we are so focused on something as irrelevant, tangential and elitist as wild territories.

²¹ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

²² "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

²³ Page 114.

²⁴ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. N. from trans.

Well, I can tell you that a wolf, a redwood forest, or a grizzly bear don't think of wilderness as elitist."²⁵

Most of them shared the idea that the current civilization was inevitably going to collapse (sooner rather than later) and that it was necessary to conserve as much of the wilderness so that nature and the evolutionary flow could preserve their integrity and recover as soon as possible. In 1986, Foreman wrote: "I hold to the idea that civilization is irreformable, that our task is to stand firm, to protect native nature, until Mother Earth returns (...) and wipes us out with the next Ice Age (..)".²⁶

Of that expected collapse, they only cared, initially, about what was related to nature. They did not propose any kind of alternative social or economic model. "It is absolutely essential to understand that EF! it did not arise from the anarchist movement or from the left. (...) EF! It grew directly out of the public lands conservation movement—from The Wilderness Society, the Sierra Club, Friends of the Earth, and the National Audubon Society."²⁷ In 1982, Wolke recalled that "[EF! was founded to] fight for the actions and programs necessary to preserve the health and diversity of our biosphere. We do not need to worry about how to restructure society to suit our proposals. (...) We are not involved in trying to save civilization." [28]

As for the causes of the destruction of nature, the initial members of EF! They did not fully clarify them. The destruction of wild nature was caused, according to them, by various factors: the "human plague", overpopulation, anthropocentrism and/or civilization. For some, the problem was humans themselves, by themselves, the human species was incompatible with nature.²⁸ Others believed that the problem was not *Homo sapiens*, but their quantity: "I don't think I'm exaggerating if I say that all the problems of the human species are caused or aggravated by overpopulation and its rapid growth. Pollution, overexploitation and depletion of 'resources', war, tyranny, loss of freedom (freedom is inversely proportional to population density) and, most importantly, the destruction of natural diversity and the systems that support life on Earth are the result of human overpopulation."²⁹ On other occasions, anthropocentrism was blamed, the idea that humans are superior to the rest of the animals and to nature, and it was even said that the abandonment of anthropocentrism in favor of a biocentric ethic³⁰ would suppose a change in the relations between human societies and nature. And finally, many texts placed industrial civilization as the cause of the problems that

²⁵ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

²⁶ "Sweat lodge" in the original. *N. from trans.*

²⁷ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

²⁸ "DNR" in the original. "Department of Natural Resources". *N. from trans.*

²⁹ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

³⁰ "National forests" in the original. *N. from trans.*

affect nature. These factors acted separately or together, depending on the authors and even the texts.

Over time, even before it began to be strongly influenced by ideas related to social justice, EF! it continued to develop and deepen its fundamental values and ideas.³¹ This development was greatly influenced by the spread of deep ecology³² in the US. In fact, it seems that few original members of EF! They knew in depth the philosophy of deep ecology, despite this, they identified with its criticism of anthropocentrism and its ethics of respect and defense of the biosphere. Soon EF! it would come to be considered, and to be considered, part of the deep ecology movement.[34]

4. Program

Their program was published in the number one issue of *Earth First* (which at the time was just a photocopied newsletter) in November 1980. The program consisted of a system of large ecological reserves - stretches of wilderness large enough for natural processes to continue undisturbed.³³ At least one reserve in each of the major ecological regions of the United States, that is, forty-four wilderness areas totaling more than 55.5 million hectares. In addition, it called for a halt to development in Alaska and the designation as protected wilderness of all roadless land owned by the Bureau of Land Management and the Forest Service.

The program also "included reasonable proposals such as a logging ban, negative human population growth, and more controversial ones such as declaring the Moon a protected wilderness area." [36] And it concluded with a list of demands for a "correct management of the territory": "no nuclear power plants, dismantle all existing ones; no to uranium mines; no more open pit mines; no more power plants (thermal, nuclear, hydroelectric); no more prey; no more roads on public lands; complete ban on recreational use of off-road vehicles."³⁴

On the other hand, EF! he didn't want to limit himself to protecting and stopping development in wildlands, he wanted to regenerate other degraded ecosystems:

³¹ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

³² "Wilderness way" in the original. "Wilderness" is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as "wild nature". Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

³³ "Wise-use movement" in the original. The "Wise Use" movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

³⁴ "Between villages there is a death zone" in the original. *N. from t.*

“It’s time to *re-create* wildlands; identify key areas, close roads, remove development infrastructure, and reintroduce extirpated wildlife.”[38]

As has already been said, the ultimate goal of EF! it was to conserve the necessary biological diversity so that, whatever happened, there would be enough genetic variety for wildlife to recover and for evolution to take its course.

5. Organization

The founding members of EF! they decided that this “would be an unorganized movement: without directors, without regulations or statutes, without quotas, just a group of women and men committed to the Earth.”³⁵ From what they perceived of the results of the organization of the society and possibly because of what they had experienced while participating in mainstream conservation groups, they wanted to avoid hierarchical and authoritarian structures and create a movement with as little structure as possible: “[W]hen you assume the structure of the corporate state, you develop the ideology and essence of the corporate state. So what is the kind of human organization that really works? The hunter-gatherer tribe, so we tried to mimic the structure of that type of organization”[40]. Although it is true that they did not have directors, as in any movement, and even as in any human group, there were leaders, people who stood out from the rest and were more influential and whose opinions were more respected. A very clear example is Dave Foreman who was, until 1990, the main and most influential organizer and ideologue of the movement and its most prominent public representative.

In its early days, EF! he endowed himself with two internal organs: the *Circle of Darkness* and *The Wet Blanket*.³⁶ The *Circle of Darkness* was “the governing body of EF! and at first we decided that he was going to be in really tight control”,[42] his “role was to determine policy, authorize new members and new state and local groups, elect new members of the *Circle* and, in generally, ‘lead the team’”. Members of the *Circle* had to be willing to be publicly identified with EF! and they could not work for or lead ‘mainstream’ conservation groups. Twelve individuals were elected as members; among them were the original ‘group of five’ and Susan Morgan.”³⁷ As for *La Manta Mojada*, it was “an official and secret group of advisors to the *Circle*”,[44] “made up of

³⁵ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

³⁶ 1 mile is approximately 1.6 km. *N. from t.*

³⁷ In this regard, see also the presentation of “There where man is a visitor” by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

eight people who were part of groups moderate conservationists”,³⁸ whose role was “to prevent the *Circle* from going too far”.³⁹

It seems that neither of these two internal organs had much influence on the development of EF! According to Foreman, *La Manta Mojada* had a “brief” and “ineffective” existence.⁴⁰ The *Circle of Darkness* was never formally disbanded but it seems that their last official performance took place in 1982 and their last meeting in 1986.

Actually, in the long run, it seems that the organization of the movement revolved around much less formal and rigid elements: the *Earth First! Journal* (EF!J onwards), the movement’s publication, and the Round River Rendezvous (RRR onwards), its annual meetings.

The RRRs were almost always held on the 4th of July (the US national holiday). They took place in or near wilderness, often in areas threatened by roads, logging, etc. “Foreman wanted to call it ‘rendezvous’, like the meetings that Indians and mountain people used to have in the far West; Koehler added ‘round river’ from the allegorical river that flows on itself, symbolizing the constant flow of life that Aldo Leopold eloquently wrote about”.⁴¹ In them there were talks, workshops, debates, concerts, etc., and they fulfilled the function⁴² of attracting potential members, for members to get to know each other personally, to debate ideology and strategy, to maintain a strong feeling of belonging and, usually, also to take advantage of the concentration of activists to organize actions of sabotage and protest against the threats that hovered over the place where they were held. Participation increased from approximately 60 people who attended the first meetings in 1980,⁴³ passing through approximately 200 and 300 people in 1982-85,⁴⁴ up to 500 in 1986-1988.⁴⁵ In some meetings, especially

³⁸ “Wilderness” in the original. This term refers to lands and ecosystems that are little or not at all humanized. Depending on the context, it can be translated in various ways: “wild lands”, “wild territories”, “wild areas”, “wild ecosystems” or, more generally, “wild nature”. In this text it has been translated as “wild nature” except in cases where it is explicitly indicated otherwise. *N. of t.*

³⁹ “Wilderness” in the original. *N. of t.*

⁴⁰ “Wildness” in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply “wild nature”. Here, except where otherwise noted, it has been translated as “the wild character.” *N. of t.*

⁴¹ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

⁴² “Wilderness” in the original. *N. of t.*

⁴³ “Rambunctious garden” in the original. It is an allusion to *Rambunctious Garden* which, as the author points out below, is the title of a book by Marris in which he defends the domestication and management of the Biosphere. *N. of t.*

⁴⁴ “Breakthrough Institute” in the original. *N. of t.*

⁴⁵ “Think tank” in the original. Think tanks are usually organizations made up of multidisciplinary theorists and intellectuals who express their opinions on[https://es.wikipedia.org/wiki/Pol%3%adtica_social][social policy],[https://es.wikipedia.org/wiki/Estrategia_pol%3%adtica][political strategy],[https://es.wikipedia.org/wiki/Econom%3%ada][economic]o[https://es.wikipedia.org/wiki/Militar][military],[https://

the first ones, members of the major conservation groups, the National Park Service, the National Forest Service and even the Bureau of Land Management participated.⁴⁶

But the real “heart” of the movement was the *EF!J*. Its origins lie in a newsletter entitled *Nature More* that Foreman published after the first RRR and sent out to nearly five hundred conservationists⁴⁷. In *Nature More*, Foreman explained the basics of EF!’s ideology, strategy, and structure. As late as 1980, it changed its name to *Earth First*, which was edited and published by Susan Morgan and Pete Dustrud in newsletter format until 1982 when it was renamed *Earth First! Journal* and adopted the newspaper format.

Both when it had a bulletin format, and when it began to be published in a periodic format, eight issues were published per year (following the months of the old European pagan calendar). The publication, which began as free, went on to cost two dollars in 1986 and, later, reached three.

In the first issue as *EF!J*, Foreman explained “the role he felt the newspaper should play”:

He proposed three areas to focus on:

1. To provide a forum for internal debate within the conservation movement, on strategy, organization and the like, and to criticize, where necessary, individual environmental groups for their concessions or ‘recovery’;

2. Offer a forum for non-technical debate on biocentric philosophy -Deep Ecology- among grassroots activists; Y

3. Present ambitious and ecological proposals on the wild territories and debates about issues related to conservation from a strong point of view.

Stemming from the third, a fourth area soon developed, as the EF! it was involved in the physical defense of the natural world. Often, news coverage of environmental direct action was on our front page.⁴⁸

In addition to the work of training, deepening and theoretical debate, the *EF!J* provided practical information on sabotage techniques, informed about the activities and calls of the different local groups and published a list with all the national contacts and

es.wikipedia.org/wiki/Tecnolog%C3%ada][technology]o[https://es.wikipedia.org/wiki/Cultura][culture .]They are characterized by having some kind of ideological [https://es.wikipedia.org/wiki/Ideol%C3%b3gica][n] orientation and are often related to military laboratories, private companies and academic or research institutions. another type. His works usually have an important weight in politics and public opinion, particularly in the United States. *N. from t.*

⁴⁶ “Wilderness” in the original. *N. of t.*

⁴⁷ “Untrammelled by man” in the original. It refers to a famous and controversial section of the US Wilderness Act (section 2c). *N. from t.*

⁴⁸ Secondary growth forests, or secondary forests, are forests that have grown again after being felled and that, after a sufficiently long period, are in the process of recovering, so that the effects of felling cease to be appreciable. Secondary forests are different from forests that regrow after natural disturbance (early serial forests), such as fire, pests, wind, etc. since they largely lack the nutrients, as well as the protection against erosion or the capacity to retain water in the soil that dead trees provide. *N. from t.*

international EF! In other words, the *EF!J* kept the movement united, in contact, set common ideological and strategic guidelines and, furthermore, constituted the public image of EF!

As subscriptions grew, “it soon became obvious that some formal organization was necessary to cash checks, obtain a permit for bulk mailing, and carry out the other business activities associated with a regular publication.”⁴⁹ “Because, legally, EF! is not a formal organization, to meet legal requirements this publication is a private business. (...) Let EF! be a movement, a non-organization. But within the movement there is the publication *EF!J*, an independent entity that serves the movement as a means of communication.”⁵⁰

That the newspaper was legally owned by the publisher (first Pete Dustrud, later Dave Foreman and John Davis) led to many internal problems that I will deal with later. It seems that these were not just legal issues, as Foreman later wrote: “For some, the split between EF!J and the EF! it was difficult to understand. However, I always felt that it was vital to maintain this separation (...). Moreover, I felt that EF! would stay more focused on its initial goals of conserving wilderness if editorial control was in the hands of a small group of people who shared a common vision of what EF! and that they were committed to an impartial exchange of ideas within those parameters, than if such editorial oversight were diffused among a broader but less accountable community.”⁵¹

But the *EF!J* was not only the ideological and organizational “heart”, it was also “the financial base of the whole movement”.⁵² Coupled with donations and the sale of t-shirts, stickers and calendars, the *EF!J* made the movement financially stable and self-sufficient. In 1986 the budget of EF! it was more than \$100,000⁵³ and in 1988 it reached more than \$250,000.[61]

6. Strategy

Phew! It was the first movement to defend, elaborate a theoretical reflection and put into practice on a large scale sabotage and direct action for ecological reasons. In fact, the defense of sabotage is, without a doubt, one of its characteristic aspects as a

⁴⁹ “America’s federally designated wilderness system” in the original. *N. of t.*

⁵⁰ There is a partial Spanish translation of “A Sandy County Almanac” in *An Earth Ethic*. Waterfall Books, 2005.

⁵¹ Literally “Dust Bowl”, “Dust Bowl” is the name by which the phenomenon is known in English that in the 1930s affected the plains and prairies that stretch from the Gulf of Mexico to Canada. The soil, stripped of moisture, was blown up by the wind in great clouds of dust. The drought-resistant grasses of the original prairie ecosystem were replaced by wheat crops that, failing due to drought, left the soil bare, creating dust storms of unprecedented magnitude. *N. from t.*

⁵² There is a Spanish translation of “Thinking like a mountain” in *An Ethics of the Earth*. Cataract Books, 2005. *N. from t.*

⁵³ “Wildness” in the original. *N. from t.*

movement. Within the newspaper, broad coverage was given to practical information, theoretical defense, and ecosabotage propaganda. In fact, there was a column, called first “Eco-tactics” and later “Dear Ned Ludd” (Dear Ned Ludd), dedicated to publishing different methods of ecosabotage.⁵⁴ Straight out of the pages of *The Monkey Wrench Gang*, the image of the “eco-warrior” who performs sabotage at night, took on an overemphasis in the “mythology” of EF!

For Foreman and the rest of the founders, “ecological sabotage is not revolutionary. Their goal is not to overthrow a social, political, or economic system. It is merely the nonviolent self-defense of the wild. Its goal is to keep industrial ‘civilization’ out of the wilderness and push it back from those spaces that should be wild.”⁵⁵ Sabotage, for them, “can not only be morally justified, but it is morally necessary. When you look at the nefarious assault that the industrial state is carrying out against the public wilderness, against natural diversity - the war declared and carried out by all means against the ecosystems of the entire world - one is forced to have take into account all means of dealing with that destruction.”⁵⁶ While defending it, they were aware of the potential dangers of sabotage in such a decentralized movement and Foreman and Wolke took pains to theorize in depth about the causes and motivations of sabotage and to criticize the thoughtless and non-strategic use of sabotage as well as mere vandalism. ⁵⁷

Through the habitual use of sabotage and direct action, EF! It succeeded in advancing one of its goals: “to expand the environmental spectrum to a point where the Sierra Club and other groups are considered moderates.”⁵⁸

Anyway, although the image from EF! is fundamentally associated with sabotage and direct action, the truth is that the founding members did not reject any tactical option, as long as no concessions were made. In the words of Howie Wolke: “In defense of wilderness, freedom, and the diversity of life, we must use every available tool and tactic: intellectual, legal, illegal, passive, and – when necessary – violent.”⁵⁹ In 1983, Foreman wrote: “Many members of EF! They work from within the system to protect natural diversity from the perspective of Deep Ecology. They find their role in designing boundaries for wilderness without making concessions, identifying territories that can be rehabilitated (closing roads, tearing down dams, revegetating cleared areas, reintroducing extirpated wildlife), testifying in court from an uncompromising stance, pressuring bureaucrats and politicians, educate the public and draft tough demands. They fight in the same field as the Sierra Club and the Audubon Society but without accepting the rules of the game created by the agents of industrial power. That may be

⁵⁴ Norse. *N. from t.*

⁵⁵ “Self-willed” in the original. *N. from t.*

⁵⁶ “Arctic National Wildlife Refuge” in original. *N. from t.*

⁵⁷ “Wildness” in the original. *N. from t.*

⁵⁸ “Wilderness” in the original. *N. from t.*

⁵⁹ *Idem. N. from t.*

less glamorous than direct action but it is extremely important.”⁶⁰ It is worth noting as an example that one of EF!’s biggest “victories”, the Bald Mountain road stoppage, was achieved by lawsuit filed by Ric Bailey of the EF group! from Oregon.

Another very important point of the strategy adopted by EF!, derived from its biocentric ethics and in which they were pioneers, is the use of arguments based on evolutionary biology and the, then still incipient, conservation biology. Most of the conservation groups of the time defended wild territories with recreational, aesthetic arguments and/or because of the presence in them of certain emblematic and threatened animals (wolves, bears, etc.). EF!, however, defended arguments based on evolutionary biology,⁶¹ on the need to conserve large interconnected ecosystems in which evolution could run its course autonomously, by and for itself. “We are not talking about the landscape. We are not talking about aesthetics. We’re not talking about primitive, non-motorized recreational opportunities. We are talking about life. We are talking about three and a half billion years of life on this planet. The totality of the flow, the fullness and the flourishing of evolution on this planet for much longer than we can imagine. The activities of this generation could truncate all that fullness, all that flourishing (...) We are involved in the most sacred crusade ever waged on earth.”⁶² Furthermore, by showing the gravity and depth of the ecological crisis, they managed to enhance the feeling that you could not wait, that the urgency was such that you had to act now.

7. Evolution⁶³

After founding EF!, the initial members sent their newsletters and invited their contacts (colleagues, former colleagues from conservation groups, etc.) to the RRR, from which a small nucleus emerged from which EF! it grew slowly until it reached the spring of 1981. At that time EF! made its first big public action, seventy-five members of EF! They met at the Colorado Bridge near the Glen Canyon Dam. While most of them demonstrated and shouted “Free the Colorado River!”, a small group of five people climbed the dam and unfolded a huge black plastic tarp of more than 90 meters in the shape of a crack that made it look like that the dam had broken. They chose that dam for two reasons; first and foremost, “Glen Canyon Dam is the symbol of the destruction

⁶⁰ The author refers to the discovery of large geometric figures of earth (geoglyphs) in certain areas of the Amazon basin. See, for example, “Environmental impact of geometric earthwork construction in pre-Columbian Amazonia,” John Francis Carson, Bronwen S. Whitney, Francis E. Mayle, José Iriarte, Heiko Prümers, J. Daniel Soto, and Jennifer Watling, in *PNAS*, July 7, 2014. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>]. *N. from t.*

⁶¹ “Wilderness” in the original. *N. of t.*

⁶² Genus *Megatherium*. *N. from t.*

⁶³ 1 foot = 30.48 cm. *N. from t.*

of wilderness, of technology's rape of the West'⁶⁴ and, second, Glen Canyon Dam was their dream goal. with destroying *The Monkey Wrench Gang* characters. The action had quite a repercussion in the media, a few months later, *The Progressive*, a magazine with national circulation, published an article by Foreman in which the position and ideology of the movement were exposed. "Following the publication [of the article], the EF! was inundated by more than three hundred letters and requests for information from people interested in the movement."⁶⁵

Also in 1981, EF! began preparing for its first *Roadshow*, a tour of different parts of the country intended to "spread public awareness of EF!, help organize EF! From all over the country, recruit new members and especially bring together EF members! and collect their ideas."⁶⁶ The first *Roadshow* began in 1982, lasted three months and toured 40 cities, including talks by Dave Foreman, songs by Johnny Sagebrush (a pseudonym for Bart Koehler) and the projection of a film of the action of the dam of Glen Canyon. The *Roadshows* were repeated for years and seem to have been effective in recruiting new members; according to Manes, "later, many members of EF! they would say they got involved in the movement because of Foreman's ability as an agitator for nature."⁶⁷

Within a year of EF!'s founding, the number of subscribers to the movement's publication grew to 1,500 and continued to grow to 10,000 in 1989.⁶⁸ Local groups multiplied throughout the country, carrying out actions independently and organizing their own regional meetings. The quantitative growth of EF! It was impressive, however, this growth had negative consequences that were getting worse and worse.

Back in 1982, the first internal problem arose when Pete Dustrud resigned from his post as editor of the newsletter. The reason was the differences regarding the defense and dissemination of eco-sabotage. In his last issue as editor, Dustrud explained the reasons for his abandonment: "An aspect of this newsletter that has always caused me problems has been the eco-tactics or the Ned Ludd column. I have expressed my concerns to the EF *Circle* on many occasions! about the legal and ethical implications of submitting a column aimed at publishing such tactics. During that period, the few 'eco-tactics' proposals I received went from being relatively harmless and comical pranks to proposals that seem to me to be very close to outright violent. Also, most of the few responses from readers on this question seem to reinforce my concerns. In light of this, I became increasingly uncomfortable with the notion that such a column was productive. I now think that a column on eco-tactics, like Ned Ludd's, is at best absurd and at worst suicidal."⁶⁹

Problems related to the rapid growth of EF! and, consequently, with the ideological and strategic differences within the movement they did not stop increasing. The initial

⁶⁴ Rodents of the genus *Dipodomys*. *N. from t.*

⁶⁵ *Ambystoma tigrinum*. *N. from t.*

⁶⁶ "Pleistocene rewilding" in the original. *N. from t.*

⁶⁷ "De-extinction" in the original. *N. of t.*

⁶⁸ "National Public Radio" in the original. It refers to an American radio station. *N. of t.*

⁶⁹ "Wilderness" in the original. *N. of t.*

members of EF! they never stopped advocating diversity. According to them, everything went as long as the Earth came first. For example, in his famous article published in *The Progressive*, Foreman wrote that “diversity is not only what gives life flavor, but also what gives it solidity. We decided that the only thing necessary to become part of EF! it was the belief that the Earth comes first. Other than that, EF! it would be big enough to bring together street poets and rowdy bartender cowboys, agnostics and heathens, vegetarians and raw steak eaters, pacifists and those who think turning the other cheek is a good way to get your ass kicked .”⁷⁰ For his part, Howie Wolke wrote: “(...) in EF! We have often advocated tolerance for a wide range of beliefs and values within our ranks. We like to say that the only thing that really matters is our common belief that Earth comes first. This human diversity within our movement is, in fact, a positive thing.”⁷¹ In addition, faith in diversity was joined by faith in action, a famous and oft-repeated phrase by Foreman was: “The key is action. Action is more important than philosophical Pac-Man or the infinite refinement of dogma (for which radicals are so well known). Let our actions establish the finer points of our philosophy.”⁷² In 1988, Foreman wrote: “In the early days of EF!, we decided there was no reason to anticipate or prepare for growth-related problems.”⁷³ So, faced with rapid growth in new members, Phew! It had neither a firm and solid ideology, nor a real organization. What happened (it is easier to say it in hindsight) was to be expected.

Phew! He continued to get involved in hundreds of campaigns against roads, felling, biotechnology research centers, etc. in various states such as California, Oregon, Colorado, Washington, Utah or Idaho, some with success and many others without. With intense activity throughout the country, the movement acquired a certain public notoriety and appeared with increasing frequency in the press, radio and television. Phew! it was the fashionable group. Some of the founding members, for example Barth Koehler, began to realize that “the lack of structure in EF!, (...) was fine when we were just a few, when we were just a small tribe. But pretty soon it got totally out of hand. There was no responsibility and it became crazy.”⁷⁴

As I said above, in its early days, most members of EF! they were conservationists focused on defending wilderness. But, especially after 1984, the movement attracted many people interested in paganism, social justice or animal rights as much or more as in the wilderness. Furthermore, it is likely that, as in all movements, many people only participated in EF! because in this way he managed to satisfy his need to belong to a group or a community. See, for example, what a certain “Bob” said about an RRR:

⁷⁰ “The wild” in the original. *N. from t.*

⁷¹ “Impact investing” in the original. It refers to investments, in companies or organizations, theoretically made with the intention of generating a social or environmental benefit apart from economic benefits. *N. from t.*

⁷² “Wilderness” in the original. *N. of t.*

⁷³ *Idem. N. of t.*

⁷⁴ In relation to the concept of “productive landscape” see the article “Why the productive landscape doesn’t work” by George Wuerthner, in *Untamed Nature*:

“(...) you realize that there are other people who feel the same as you and you feel free to say what goes through your head . For me, the RRR is the only opportunity to meet people I can be with.”⁷⁵

Phew! he had always flirted with paganism and other so-called “Earth religions”, see for example the last point of the “Declaration of Principles”. *EF!J* itself used pagan calendar dates in its masthead and its pages “expressed enthusiasm (...) for paganism, indigenous religions and, sometimes, religions originating in Asia, especially Taoism and Buddhism.”⁷⁶ In its first newspaper-format editorial, the *EF!J* declared that it would provide “a space for discussion of the various types of religions on Earth—neo-pagan, pantheistic, Christian, Buddhist, agnostic... ”.⁷⁷ More and more people interested in religion, especially from California and the northwestern states, on the Pacific coast, joined the movement, bringing with them religious rituals, contributing texts and letters to the newspaper, etc. A couple of years before leaving *EF!*, Howie Wolke lamented, surely rightly so, that “many potential supporters are put off by the paper’s *apparent* defense of paganism.”⁷⁸

Also from California, Oregon and Washington came most of the members interested in having *EF!* broaden its goals to advocate for various issues related to social justice. It appears that “the Pacific Northwest was full of former anti-war activists trained in nonviolent civil disobedience.” Many of them also came from the civil rights, anti-nuclear, feminist, or anarchist movements. Those people, “from the beginning,” according to Foreman, “have been drawn to *EF!* because, to them, he represented a reincarnation of New Left style and intensity. Soon enough, we began receiving letters berating us every time we strayed from the ‘politically correct’ leftist line and asking us to develop ‘a more sophisticated critique of capitalism.’ The issue of overpopulation, in particular, represents a nightmare for the left, and any *EF!J* article dealing with that tangled issue has been bound to receive an immediate, albeit small, barrage of criticism. darts. Coinciding with this growing denunciation from the left, there has been a growing involvement in *EF!* of men and women, generally young, who held vaguely ‘anarchist’ ideas and lifestyles.”⁷⁹ And with them came internal debates about anti-capitalism, feminism, animal rights, solidarity with the third world etc

And at this moment is when one of the founders of *EF!*, Mike Roselle, begins to have a greater presence. As I have said, Roselle was the only one of the founding members who did not come from the conservation movement but from the left (the Yippies and the Zippies). Until the mid-1980s, Roselle “was the lone dissident. I wanted to play *EF!* a mass movement, a desire that set him apart from the rest of the founding members.”⁸⁰ Over time, the differences between Roselle and the other founding members became

⁷⁵ “Black-footed ferrets” in the original. *Mustela nigripes*. *N. of the t.*

⁷⁶ “Swift foxes” in the original. *Vulpes velox*. *N. of t.*

⁷⁷ “Wolverines” in the original. *Gulo gulo*. *N. from t*

⁷⁸ 1 square mile is roughly equal to 2.59 square kilometers. *N. from t.*

⁷⁹ 1 mile is roughly equal to 1.6 km. *N. from t.*

⁸⁰ “It’s these feelings, wilderness-impassioned and modest and respectful” in the original. *N. of t.*

more evident and it is worth asking: why then did Wolke, Koehler, Foreman and Kezar join Roselle? Perhaps they did not know him well enough or perhaps they cared little about the existing differences if they were united by the defense of the Earth, but Roselle himself provides another possible option: "I think they realized that he had a lot of experience and that this could be necessary if start a new radical environmental group (...), because he had a lot of experience in radical groups and knew the politics of confrontation, how to work with the media and how to organize techniques to help people develop a program of confrontation. Environmentalists at the time didn't know how to do any of those things."⁸¹

Mike Roselle had always been a very active member of EF! and, unlike most of his initial colleagues, his interests were not only focused on those directly related to the preservation of wild territories. He believed that it was necessary to understand the relationship between the ecological crisis and the current distribution of wealth and power, he also believed that through education and propaganda the course of human societies could be changed, he trusted that if EF! If it became a mass movement, it could achieve a change towards a society that lived in a more harmonious way with nature. While the rest of the founders were staunch defenders of eco-sabotage, Roselle was more in favor of direct action⁸² and civil disobedience. In addition, Roselle was the only founding member who did not live in the Southwest but in Northern California, a state in which half of *EF!J*'s subscribers also lived.⁸³

In late 1983 Roselle had played a major role in the first major campaign in California, the defense of the Sinkyone Forest, and in the spring of 1984 he had been the main driver of a nationwide boycott and civil disobedience campaign against Burger King for its responsibility in the deforestation of South America. Some time later he founded the "Nomadic Action Group"⁸⁴ (Group of Nomadic Action), Greenpeace named him National Coordinator for Direct Action and began to also act as coordinator between EF! and another group involved in international rainforest conservation, the Rainforest Action Network. The members of EF! more concerned with social justice began to see in Roselle a leader more in tune with their concerns and thus, in a certain way, Roselle acted as a vortex around which such members began to unite.

Things were changing at EF! but Foreman, in 1985, continued to celebrate "the size of the movement and the fact that it had been 'wrested from the hands of its founders'

⁸¹ 1984, Part II, Chapter IX.

⁸² Ibid.

⁸³ Orwell defines freedom in a leftist and humanist framework. According to this, freedom is to be free from natural physical hardships thanks to the blessings of a human society that has subjugated wild Nature, and not being under political pressure, not being exposed to discrimination (class, race, religion, etc.), and with an income that will make it possible to enjoy the blessings of human society.

⁸⁴ He seems to have written 1984 as a warning for this threat. Many features of the totalitarian dictatorship described in the book were borrowed from the Stalinist dictatorship that prevailed in the Soviets at the time of the book's writing. It seems that Orwell saw the spread of this political system around the world as the greatest danger in the future.

to become a 'tribe.'"⁸⁵ A growing percentage of that tribe They were young people who came to the movement with interests and a trajectory very different from that of the majority of the founding members. An example of this new breed of member was Mike Jakubal, "with no prior training in the mainstream conservation movement, unlike EF! founders [Jakubal] and a second generation of EF! they wanted radical environmentalists to champion a broader opposition to capitalism and its consumer culture, along the lines of the anarchist critique found in publications such as the *Fifth Estate* newspaper."⁸⁶ According to Jakubal, limiting radical environmentalism to issues related to wild territories 'can only lead to partial and temporary solutions. And what would be worse, to undermine and delay the truly radical transformation – which can only be described as revolutionary – necessary to save wild ecosystems and everything else.'"⁸⁷ Jakubal gained some fame within EF! by being the first to initiate a new technique of civil disobedience that would end up being a kind of "house brand" of the movement: *tree-sitting*.⁸⁸

In the pages of the *EF!J*, the publication of articles and letters that had little to do with the conservation of wild territories became commonplace, in addition, the appropriateness of sabotage began to be frequently debated ; in the RRR, workshops and debates on gender, animal rights, etc. began to be scheduled. The internal tensions were becoming more acute in the movement and, from 1987-1988, they would be precipitated by two new factors: the articles by Miss Ann Thropy and the arrival at EF! by Judi Bari.

Judi Bari lived in California and her entire political career had revolved around feminism and workerism. When he heard about EF! for the first time, "I was horrified by

⁸⁵ Orwell explains the inability of totalitarian bureaucrats to reduce technology to a point before the Industrial Revolution as follows: Reducing the technology to a point below the Industrial Revolution, and most importantly, halting the development of military technology would greatly disadvantage the states which do these things in the competition with other states and would result with the destruction of the ruling classes of those states.

⁸⁶ We see that the masses of today's techno-industrial system, which have far better material conditions than the lower classes of 1984 on average, have a fundamentally similar attitude. Contrary to the beliefs of the progressives, the consequences of machine technology reducing physical labor and increasing material well-being didn't turn out to be people's dedication to "loftier" and "creative" activities. On the contrary, the indolent lifestyle created by technological development drags people into meaninglessness, creates psychological problems and dissatisfaction, and to suppress these problems to some extent, people immerse themselves in hedonistic pleasures: consumption, movies, TV series, computer games, pornography, etc.

⁸⁷ The role that Huxley and Orwell assigned to sexuality in their dystopias is diametrically opposite to each other, and Huxley's utopia predicted the role that sexuality plays in the current techno-industrial system much more accurately. We will return to this topic in the sections where we discuss *Brave New World* and the present techno-industrial system.

⁸⁸ Real freedom has nothing to do with doing what the system allows; it consists of having the possibility to meet one's fundamental needs with one's own abilities and initiative, individually or as a member of a small group.

their macho image and anti-worker attitude. I thought it was embarrassing.”⁸⁹ However, he was “attracted to EF! because they were the only ones who were willing to place their bodies in front of the bulldozers and chainsaws to save the trees. They were also funny, irreverent and played music. But what definitely conquered [her] was her philosophy. That philosophy, known as biocentrism or deep ecology,⁹⁰ says that the Earth is not here solely for human consumption. All species have the right to exist on their own and humans, instead of trying to shape nature to meet their needs, must learn to live in balance with its needs.”⁹¹ For Bari, nature was a Another victim to be added to the long list of “victims” of capitalism: women, workers, racial minorities, third world countries, etc.

Bari joined EF! in 1988 and the first thing he did was give a talk on the history of the Industrial Workers of the World (IWW)⁹² socialist union at the RRR.⁹³ “Quickly, Bari became known in EF circles! Of California. She was forceful and direct - and firm in her belief that ecological problems were inextricably linked to questions of social justice. Not only did he insist on spreading the message of EF! to other activist groups, but also to bring their messages to EF! Bari was particularly keen that EF! and its members were to embrace feminism.”⁹⁴ Bari believed that to save the Pacific Northwest’s redwood forests, which were largely on privately owned land, it was necessary to bring together logging workers and environmentalists, so he began organizing alliances with the IWW to form a “radical union of forestry workers organized together with members of EF! to save both jobs and ecosystems. The idea soon became a reality as the ‘IWW-Earth First! Local 1’ that united radical environmentalism and revolutionary unionism under the same roof, forming an unlikely ‘green unionism’.”⁹⁵

⁸⁹ With the developments of computer technology (like machine learning algorithms and ever more powerful processors), the system has also started to target people individually with its methods of enchantment. Contents that are shaped for specific individuals in shopping websites, video streaming websites, etc. are becoming the norm.

⁹⁰ For the definition and a more detailed discussion of the power process, see: Theodore John Kaczynski, *Industrial Society and Its Future*, paragraphs 33-37.

⁹¹ Some of them internalize these values so intensely that when they try to rebel against the established order they can’t think of anything else and use the system’s values to rebel against it. For a more detailed discussion of this subject, see Karaçam, “Leftism, Techno-Industrial System, and Wild Nature” and Último Reducto, “Leftism: The function of pseudo-critique and pseudo-revolution in techno-industrial society”.

⁹² Hans Moravec, “When Will Computer Hardware Reach the Human Brain?” *Journal of Evolution and Technology* (1998), vol. 1.

⁹³ See “Seven Deadly Trends” in *Martin Ford, Rise of the Robots: Technology and the Threat of a Jobless Future*, Basic Books, 2015.

⁹⁴ Translation by Último Reducto of “A Critique of and an Alternative to the Wilderness Idea” according to the reprint published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article in *Wild Earth Magazine* 4, No. 4 (Winter 1994/1995):54-59. © 1994 J. Baird Callicott. *N. from t.*

⁹⁵ US law regulating the legal protection of certain areas declared wilderness. *N. from t.*

In 1986, a couple of years before Bari's entry into EF!, the first of a series of three articles by "Miss Ann Thropy",⁹⁶ a pseudonym, appeared in *EF!J* used by Christopher Manes, entitled "Technology and mortality", was followed in 1987 by "Overpopulation and industrialism" and "Population and AIDS". These articles generated intense controversy in EF! and in the rest of conservationism and environmentalism. They dealt with the problem of overpopulation from a perspective far removed from the "politically correct". In "Technology and mortality", Manes provided a biocentric definition of "overpopulation": "any human society is overpopulated when it interferes with the cycles of nature, thus threatening to permanently reduce global diversity".⁹⁷ He went on to state that the "main cause of overpopulation is not high fertility (...) but low infant mortality due to technological intervention", so that, according to Manes, the only effective way to solve the problem of overpopulation was to "dismantle the technological network on which medical science rests"⁹⁸ and "let natural processes take over [population control]."⁹⁹ In "Overpopulation and industrialism" he returned to the idea that overpopulation was intimately linked to industrialism and, taking into account the consequences of the latter on nature, he affirmed that the decrease in population was desirable since it would affect all aspects of the industrial society. Again Manes concluded that "any practical effort to reduce population needs to be based on undermining industrialism."¹⁰⁰ In his last article, Manes began by saying that "if radical environmentalists were to invent a disease that would bring the human population back to ecological sanity, it would probably be similar to AIDS."¹⁰¹ To lead "a hunter-gatherer way of life, the only economy compatible with a healthy earth," a huge decline in human population is necessary. According to Manes, such a decline will be inevitable, whether by nuclear war, famine due to desertification, or other environmental cataclysms, but if this were to be the case, the survivors would inherit a barren and devastated world. However, AIDS has the virtue (among others) of only affecting humans and, therefore, could significantly reduce the human population without harming other living beings. For Manes, "AIDS has the potential to put an end to industrialism, which is the main

⁹⁶ "Redneck" in the original. Although, for the sake of simplicity, it has been translated simply as "redneck" in this text, the concept of "redneck", in English and in the United States, has certain connotations, due to the social and cultural conditions of that country, which make it different from the concept of "paleta" in Spanish. On the other hand, certain non-leftist sectors of US conservationism have proudly claimed for themselves, and not without a certain amount of humor, the adjective "rednecks". *N. from t.*

⁹⁷ "Wilderness" in the original. Term that refers to lands and ecosystems that are little or not at all humanized. In these two texts, unless explicitly indicated, it has been translated as "wild zones", "wild areas" or "wild ecosystems" *N. from t.*

⁹⁸ "Wilderness" in the original. In this specific case it has been translated as "protected wilderness areas" because here the author refers specifically to the wilderness areas protected by the Wilderness Act. *N. from t.*

⁹⁹ "Wilderness preserves" in the original. *N. from t.*

¹⁰⁰ *Idem.* *N. of t.*

¹⁰¹ There is an edition in Spanish: *El fin de la Naturaleza*, Ediciones B, 1990. *N. of t.*

cause of the ecological crisis”,¹⁰² so that “if the AIDS epidemic did not exist, radical environmentalists would have to invent it”.¹⁰³ 111]

Manes’s articles hit the nail on the head and the profound incompatibilities between biocentrism and social justice became so apparent that many members of EF! they were forced to take sides. And so, especially after 1988, the movement split into two factions. In Wolke’s words: “(...) EF! it was clearly divided into two camps, the old guard against the new. Lions vs (teddy) bears. Conservationists against social activists. Hunters against hunting saboteurs. Misanthropic defenders of wild territories against leftist defenders of lost causes.”¹⁰⁴

One of the factions (I will refer to it as the Conservationist Faction, FC), was made up mostly, though not exclusively, of many of the members who had joined the movement in the first half of the 1980s, concentrated in the southwestern states. and many of them came from conservation organizations. In the FC were, for example, Dave Foreman, Howie Wolke, Bart Koehler, Susan Morgan, Christopher Manes or John Davis. This faction maintained the initial ideology of the movement: the objective of EF! was to defend wild territories, it should not divert attention from these towards the transformation of society or towards other causes such as feminism, animal rights, etc. For them, the ultimate causes of the Earth’s destruction were overpopulation, industrial civilization, and anthropocentrism. As for the tactics, they were more favorable to sabotage than to civil disobedience.

The other faction (I’ll refer to it as the Social Justice Faction, 113 FJS), was made up of mostly younger members who had joined EF! in the second half of the 1980s, arrivals, above all, from the northwest coast.¹⁰⁵ They came from various left-wing political movements, from trade unionism to the peace movement. It included, among others, Mike Roselle, Judi Bari, Darryl Cherney,¹⁰⁶ Mike Jakubal, and Pam Davis. For the FJS, the movement had to expand its objectives beyond the wild territories, to include criticism of capitalism, militarism, patriarchy, etc. Phew! It had to become a mass movement in order to transform society and move towards a more respectful way of life with nature. In general, the FJS relied more on mass civil disobedience than sabotage since, according to Bari, “there is no way that a few isolated individuals, no

¹⁰² The title of McKibben’s book: *The End of Nature* means “El fin de la Naturaleza” in Spanish and in this book McKibben further develops the idea that, in planet Earth, there are no longer any geobiological zones or processes that have not been affected in some way by human industrial activities. *N. of t.*

¹⁰³ The title of McKibben’s book: *The End of Nature* means “El fin de la Naturaleza” in Spanish and in this book McKibben further develops the idea that, in planet Earth, there are no longer any geobiological zones or processes that have not been affected in some way by human industrial activities. *N. of t.*

¹⁰⁴ “Wilderness” in the original. *N of the t.*

¹⁰⁵ “The New World wilderness condition” in the original. *N of the t.*

¹⁰⁶ “Wilderness setting” in the original. *N. from t.*

matter how brave, can bring about the enormous social change necessary to save the world.” planet”.¹⁰⁷

The most intense internal conflicts revolved around three issues: the editorial line and ownership of *EF!J*, the financing of the movement, and sabotage.

One of the most used techniques by EF spoilers! against logging was that of *tree-spiking*, which consists of driving metal or ceramic nails into tree trunks. These nails are not detected with the naked eye, so that, when trying to cut down the tree or once the logs are taken to the sawmills, they cause major breakdowns in the wood cutting and machining machines and make the process difficult and expensive. Its objective is to ensure that the costs of breakdowns or of locating and extracting the nails are high enough that logging is no longer profitable. However, its use generated much criticism both from the logging companies and the media (which described it as eco-terrorism) and from the EF itself! The FJS believed that *tree-spiking* was ineffective, endangering workers in the lumber industry¹⁰⁸ and counterproductive due to the rejection it generated in public opinion,¹⁰⁹ so that began to criticize and condemn *tree-spiking* until, “in mid-April [1990], seven members of EF! Northern California, including Mike Roselle, released a statement [renouncing *tree-spiking*] saying their decision was prompted by the emerging dialogue between forestry workers and radical environmentalists. The members of EF! Oregon did the same.”¹¹⁰ Within the FC not everyone defended *tree-spiking* either, I have already mentioned the case of Pete Dustrud as an example, but its use was not criticized either. At the heart of the matter, what happened is that there was a difference in the strategic, while the FJS wanted to form a mass movement that would transform society and thought that the best means to do so was civil disobedience, the FC only wanted to defend existing wild territories (the important thing for them was to stop direct aggression against them) and was more in favor of sabotage. The *tree-spiking* was only the most visible part of a much larger difference about the role of movement.

In 1983 the “Earth First! Foundation” (Earth First! Foundation) in order to receive and manage, under a legal, independent and tax-free figure, the donations received by the movement.¹¹¹ Through the foundation, funds were received that were later used to finance EF projects and publications! In 1986, “his annual income was more

¹⁰⁷ Cognitive dissonance refers in psychology to the perception of incompatibility due to the conflict between the different ideas, beliefs or emotions of a person, or between their behavior and their ideas, emotions or beliefs. *N. of t.*

¹⁰⁸ Proposal for the creation of a 360,000 km² large nature reserve on the US Great Plains. *N. of t.*

¹⁰⁹ *Cervus elaphus*. *N. of the t.*

¹¹⁰ *Antilocapra americana*. *N. from t.*

¹¹¹ Approximately 160,000 m². *N. of t.*

than \$20,000,”¹¹² in 1987, “more than \$50,000.”¹¹³ The money coming from both the foundation and the *EF!J* was managed by members of the FC. Roselle suspected that the FC was using the money to selectively finance those activities with which it had a greater affinity¹¹⁴ and leaving in second place the activities carried out by the FJS. In this way, according to Roselle’s suspicions, Foreman and his closest comrades would be reinforcing their position of power over the movement through that money. In a letter to Lee,¹¹⁵ Foreman, however, insisted that the money raised through the *EF!J* went directly to funding the *EF!J*. The truth is that Roselle’s suspicions do not seem far-fetched. Be that as it may, in 1987 Roselle created the “Direct Action Fund” (Fund for Direct Action) as a means to finance the activities of the FJS. That same year, in just three months, he managed to raise “more than \$18,000” and, in 1989, “the annual report of the ‘Direct Action Fund’ recorded that more than thirty thousand dollars had been distributed among various campaigns.”¹¹⁶ Despite the success of the “Direct Action Fund” the debate about the financing of the movement continued to cause confrontations between both factions.

As I have already said above, the *EF!J*, in addition to being one of the pillars of its financing, was the “heart” of the movement and, of course, was the cause and setting for many of its disputes between conservationists and social justice advocates. For the FC, the newspaper had to deal with issues directly related to the wild territories and their defense. In his 1988 RRR speech, Howie Wolke said that “the paper should focus on the wilderness and eliminate what he called ‘excess baggage’. In his view, ‘articles on issues most relevant to social reform, animal liberation, paganism, the peace movement [and]/or feminism (...) have no place in the newspaper’”.[126] John Davis, at the time editor of *EF!J*, wrote after that RRR that “he agreed with Wolke but would not ‘summarily reject’ such articles if they were ‘clearly related to the conservation of life and wild lands’.”¹¹⁷ Under Davis’ direction, the journal focused on discussions of deep ecology and articles on conservation biology. For the FJS, the contents of the newspaper, in addition to being tedious, did not represent the majority of the movement. According to them, the *EF!J* should devote more space to reporting on the civil disobedience actions carried out by EF! and to publish articles on other important topics. According to Scarce, “[anarchists] complained that (...) the *EF!J* has not published articles representative of the full spectrum of opinion and activity present in the movement, and many believe that a part of the elders of the tribe has

¹¹² North American Conservation Project. A central idea of this project is connectivity between protected areas (nuclei) through corridors for wildlife. Another important idea is the creation of buffer areas around the nuclei in which human economic activities would be allowed but would be regulated to favor the conservation of biodiversity in the nuclei. The current name of the project is Wildlands Network. *N. of t.*

¹¹³ “Greater Yellowstone Ecosystem” in original. *N. of t.*

¹¹⁴ “Spring Break” in the original. *N. from t.*

¹¹⁵ “Backcountry” in the original. *N. from t.*

¹¹⁶ *Odocoileus hemionus*. *N. from t.*

¹¹⁷ Another common name for the American antelope. *N. from t.*

imposed what is and what is not acceptable.”¹¹⁸ In an interview published by *The Nation* and the *Anderson Valley Advertiser* in 1990, Roselle said that “there’s a lot of bitterness in EF right now! due to the total lack of control over the newspaper and how, those of us who organize the grassroots movement, cannot deal with the most important issues in it.”¹¹⁹ Little by little, the FC began to realize that the movement was getting out of hand and regularly published articles in the *EF!J* where it tried to re-establish and entrench the initial ideology of EF!,¹²⁰ on the other hand, “in order to have space to publish extensive articles about biodiversity, he created three new columns in the last pages that would condense the information related to EF’s direct actions!”¹²¹ According to Bari, his articles “were edited beyond recognition and Cherney’s were not even published.”¹²²

Various external factors were added to the enormous internal tensions derived from the incompatibility between both factions. One of them was the death of Edward Abbey in March 1989. Abbey, in addition to participating in EF!,¹²³ was a friend of several of its founders and, in a certain way, had acted as an ideological referent for the movement. For Foreman, “Abbey’s death changed things”, he paused to reflect and concluded that EF! it was no longer his move. As of May of that year, he broke “all formal relations with EF!, handing over ownership of *EF!J* to a non-profit organization made up of members of the newspaper’s editorial staff. (...) its only visible link with EF! they were his public talks.”¹²⁴

Also in 1989, Abbey’s death followed an FBI investigation into various sabotages committed against high-voltage pylons, leading to the arrest and imprisonment of four members of EF! (including Foreman). It was not the first time EF members! They were arrested or imprisoned. For example, in 1985, Howie Wolke had been jailed for six months¹²⁵ for removing all survey markings for a road construction. However, on this occasion the accusations were much more serious and the presence of FBI infiltrators within the movement was also confirmed, since the arrests were made thanks to one of them.¹²⁶ Media pressure multiplied and the debates and news about EF! and ecoterrorism took more and more force in all the media.

Finally, in 1990, the sum of all the factors mentioned above pushed the movement to the limit and led to the abandonment of most of the members of the FC who joined other conservation organizations or founded new organizations. For example, Foreman,

¹¹⁸ “Aspen” in the original. Probably *Populus tremuloides*. *N. from t.*

¹¹⁹ *Pseudotsuga menziesii*. *N. from t.*

¹²⁰ *Pinus albicaulis*. *N. from t.*

¹²¹ 1 foot = 30.48 cm. *N. from t.*

¹²² “BLM” [Bureau of Land Management] in the original. *N. from t.*

¹²³ Biblical name for greed and wealth. *N. of t.*

¹²⁴ One mile=1,609 km. *N. of the t.*

¹²⁵ “Tramelled” in the original. Here, the author is referring to the passage from the Wilderness Act, mentioned above, in which it is said that in protected wilderness areas, nature has no *obstacles* imposed by human beings. *N. of the t.*

¹²⁶ Multinational chain of stores. *N. from t.*

Davis, and others founded a new organization, The Wildlands Project¹²⁷, and began publishing a journal called *Wild Earth* “focused exclusively on territories and wildlife, habitat and biodiversity.”¹²⁸ At the end of that year, the FJS took over the movement and the newspaper, which continued to be called Earth First! and they continue to exist today. However, starting in 1991, in EF! the Earth definitely ceased to be the first.

In September 1990, Bari wrote: “I don’t see Dave’s departure as a break in EF!, but as an evolution. We are not moving away from his ideas, but expanding them.”¹²⁹ And it seems that this was the appreciation of the majority of the members of the FJS, for them the rupture had been expected for a long time and was, in part, inevitable, but the movement had not become a new EF!, it had only “evolved”.¹³⁰ Of course, the analysis made by many of the members of the FC was completely different, for them, “to the Earth First movement! The same thing is happening to him that happened to the Greens in West Germany - an attempt to transform an ecological group into a leftist group. We also see a transformation towards an openly countercultural/anti-establishment style and the abandonment of biocentrism in favor of humanism.”¹³¹

8. Errors

Below I will try to list and explain what I think are the most serious mistakes made by those members of EF! focused on the defense of the wild. Not surprisingly, in many, if not all, of them, the two factions, both the conservationist and the social justice advocate, were in agreement.

8.1 *Ideological deficiencies and errors*

The FC never tried hard enough to develop a strong and coherent ideology based on the defense of wilderness. As I have quoted above, Foreman never tired of repeating that it was the actions that should establish the finer points of the EF philosophy! It is true that from the second half of the 1980s, the editors of the *EF!J* tried to publish texts that delved into its basic ideas and values, but they began this work when it was too late.[142]

¹²⁷ *Mustela nigripes*. *N. from t.*

¹²⁸ Famous American motorhome brand. *N. from t.*

¹²⁹ The tragedy of the commons is the name commonly given to the situation in which a freely accessible common resource is individually exploited. The result, in the absence of an authority to effectively regulate such exploitation, is often over-exploitation and depletion of the resource, as each individual party tries to obtain maximum profit by intensifying exploitation. *N. from t.*

¹³⁰ “Wilderness” in the original. *N. from t.*

¹³¹ “The usual line of bullshit (pun intended)” in the original. This phrase in English plays with the double meaning of “bullshit” (literally “dung”, although it is normally used with the meaning of “nonsense”), to make fun of what the rancher was saying, and explicitly points it out in the parentheses. These humorous details are impossible to translate. *N. from t.*

Many of the early members of EF! they were aware, at least intuitively, of the profound and irreconcilable incompatibility between wild nature and STIs, but they failed to delve into the causes of this incompatibility. Like I said, EF! never made clear the reasons for the deep ecological crisis, these varied between the characteristics of the human species, anthropocentrism or humanism, industrial civilization and overpopulation. Among them, the factor that stood out the most in their writings was the latter, for many of the members of EF! focused on the conservation of wild territories “human overpopulation is the main problem. If we start to solve it, many other problems will disappear.”¹³² However, most of his proposals to put an end to this problem passed through “solutions” completely dependent on technologically advanced mass societies¹³³ and, therefore, basically, incompatible with the defense of the integrity of the biosphere. wild.

Members of EF! did not try to delve into the causes of the destruction of the Earth because initially their objective was not to transform or end the STI, but simply to protect and conserve as many wildlands as possible. This made them ignore, except in exceptional cases, the problem of technology, which is the main cause of the destruction of wild nature and, among other things, also of human overpopulation. One of those exceptions was Christopher Manes. In several of his texts published in the *EF!J*, Manes tried to point out how “the positive effects of technology are inseparable from the negative ones”¹³⁴ and stated that “finding practical ways to dismantle the industrial technology is the most important task of deep ecology.”¹³⁵

Added to the lack of interest in ideological deepening was the emotional charge and the exaltation of the irrational part of human psychology in many of the articles and EF! talks. In 1986, Foreman in one of his talks said: “(...) *I’m impulsive! I am passionate. I am angry. I feel things. I’m not a New Age automaton, not a fucking computer, not a pocket calculator. I don’t have silicon chips up here. I am flesh and blood. The wind fills my lungs, the mountains form my bones, the oceans run through my veins. I am an animal and I will never be anything else. When a chainsaw cuts through a two-thousand-year-old redwood, it’s cutting through my insides. When a bulldozer bulldozes a virgin hillside, it is destroying my side and when a bullet brings down a grizzly bear or a wolf, it is piercing my heart...*”¹³⁶ Or, for example, John Seed wrote in an article titled “Thinking like a rainforest”: “We are made of the ashes of ancient stars entwined in ever brighter complexity, entwined to form jungles, to form ourselves.

¹³² In reference to the idea that private property is a natural right of the human being defended by this 17th century philosopher, considered one of the fathers of liberalism. *N. from t.*

¹³³ North American Free Trade Agreement. *N. from t.*

¹³⁴ Translation by Último Reducto of “Wilderness-Now More than Ever” according to the reprint published in *Wild Earth. Wild Ideas for a World out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article in *WildEarth* magazine 4, no. 4 (Winter 1994/1995):60-63. © 1994 Reed F Noss. *N. from t.*

¹³⁵ “Wildness” in the original. *N. from t.*

¹³⁶ “Wilderness areas” in the original. *N. from t.*

U.S. That is what I am! Yes, our very psyche is a product of the rainforest. We evolved for millions of years inside this moist green womb before emerging a scant five million years ago, blinking, into the light.”¹³⁷ Phew! He was right to try to emphasize that humans are just another animal species that arose, like all of them, from evolution by natural selection, but he was wrong to do so using such an unreasonable style. With that kind of style so common to the movement it’s no wonder that many “lit” and “mad” in search of a more “down to earth” religion or spirituality were hugely drawn to EF!

But if there is an issue where members of EF! focused on the conservation of wild territories sinned of an absolute blindness was in that of leftism. Interestingly, except for Roselle, the initial members of EF! they had little in common with the left and its values. In fact, several of them came from a rather conservative political culture: they were not politically correct, they showed little or no interest in social injustices, they criticized immigration for ecological reasons, they felt, at least to some extent, proud of their country (that the celebration of the RRR coincided with the 4th of July party was not a coincidence), they practiced hunting, etc. Yet they made no effort to keep leftists and hippies away, perhaps thinking their values would repel them, or simply didn’t even think they would be a problem. As I will discuss a little later, the leftists, of course, were not attracted and identified with EF! by the initial values of the movement, but not having clearly defined its ideology and not having kept clear from the beginning its differences with countercultural and leftist values, the members of EF! focused on conserving wilderness left the door open for thousands of leftists and hippies, with whom they supposedly shared that Earth came first, to join them and end up outnumbering them, changing the movement’s ideology and goals. Years later, Howie Wolke lamented that “we had unintentionally created a vehicle for the counterculture. Phew! it became a vehicle for anti-gay and social justice leftists, anarchists, anarcho-leftists, anti-hunt ecofeminists, and New Age illuminati cosmic energy drivers.”¹³⁸

8.2 *Rejection of the organization and defense of diversity*

In addition to the absence of a strong ideology, EF! it intentionally lacked an organization to hold the movement together. The founders of EF! they wanted to flee from useless structures and bureaucracies and, therefore, from their beginnings, they strove to “be open and non-hierarchical”, to try “to be as anarchic as possible”.¹³⁹ This lack of organization was very useful to grow quantitatively very fast since, basically, anyone who claimed to agree that the Earth comes first and who wanted to act in its defense became part of the movement (or the tribe, as it were). they also liked to call him). Phew! it acted as a network of groups more or less coordinated through the *EF!J*, the RRRs and the campaigns and concrete actions. Foreman was confident that “we have enough self-control to let EF! develop by itself. It’s hard to walk away and

¹³⁷ “National Biological Survey’s Gap Analysis” in original. It refers to an official project that later became carried out by the Biological Research Division of the US Geological Survey. *N. from t.*

¹³⁸ “Wild areas” in the original. *N. from t.*

¹³⁹ *Idem. N. of the t.*

trust other people, say 'ok, start a local EF movement! Cheer up. Here are some ideas, but use your creativity.' Other environmental groups are terrified of doing something like this."¹⁴⁰ It's ironic, but the members of EF! Focused on conserving wilderness, despite their misanthropic image, they erred in overconfidence in people. Bari and other leftists took advantage of this weakness, "(...) the structure of EF! it was decentralized and non-hierarchical, so we had room to develop our local Northern California group as we wanted."¹⁴¹

But the members of EF! focused on the conservation of wild territories, they not only generated a loosely organized movement that allowed local groups too much autonomy, they also made a constant apology for diversity. The FC was convinced that diversity was something positive that strengthened the movement. Foreman said that in EF! "There is room for everyone, from 'vegetarian animal rights defenders'¹⁴² to wild game guides, from wreckers to Gandhians (...), from embittered misanthropes to true humanitarians'."¹⁴³ And it should not surprise us that Bari had a very similar opinion: "one of the strengths of EF! it has always been our diversity. Wild country rednecks and enlightened hippies can co-exist in EF! because we are all fighting to save this planet."¹⁴⁴

8.3 *Emphasis on direct action*

Another of the decisive factors that caused EF! was inundated by leftists was its emphasis on sabotage and direct action. Not only Bari was "attracted to EF! because they were the only ones who were willing to put their bodies in front of bulldozers and chainsaws to save the trees", the anarchist group "Alien-Nation" thought the same: "we were excited by (...) the emphasis on action decentralized action from local groups";¹⁴⁵ and also Chris Laughton (one of the founders of EF! in England): "I found it very inspiring (...) it was direct action with a capital 'D', it was eco-sabotage".¹⁴⁶ Many leftists are attracted to almost anything that involves confrontation with the establishment; They don't care too much about the motives, as long as they are not openly incompatible with leftist values. What they like is action, the more shocking, aggressive or spectacular the better; feel that they are fighting against something and thus vent their anger. So EF! by giving so much importance to that part of the movement, by cultivating that image of "warriors" and wreckers, he was encouraging all those people (whether they were on the left or not) who are attracted by flashy action and /or open and hostile antagonism. And these, of course, did.

8.4 *Wrong goal: preservation of wilderness*

¹⁴⁰ "Wilderness areas" in the original. *N. from t.*

¹⁴¹ "Wild areas" in the original. *N. from t.*

¹⁴² "Wilderness areas" in the original. *N. from t.*

¹⁴³ *Gopherus polyphemus*. *N. from t.*

¹⁴⁴ *Idem*. *N. of the t.*

¹⁴⁵ "Prescribed burning" in the original. *N. from t.*

¹⁴⁶ "Wilderness areas" in the original. *N. from t.*

Another point where I think that EF! was wrong is in its central objective. A movement that values wilderness above all else will be faced with the following question: work to conserve as much wilderness as possible or end the main cause of its destruction, the STI EF! he opted for the former. It is possible that, in the short term, a movement organizing to conserve nature may have some success in gaining legal protection for certain regions. Now, this creates two problems. In the first place, it makes it seem that ITS and wilderness can be compatible, that territories with autonomous and self-regulated functioning are possible in an increasingly artificial world. And so it reinforces the system by promoting a false image that makes people believe that STIs can exist without necessarily destroying the autonomy of wild nature. Second, what will happen to those protected areas when the STI cannot afford to continue operating without exploiting the resources that exist in them,¹⁴⁷ or if the system collapses (as EF! members expected) and Do the large organizations responsible for their protection cease to exist? In both cases, the chances are that either the STI, or the societies that survive its collapse, will exploit such zones without any qualms about their legal protection or their intrinsic value. Therefore, a movement whose fundamental value is the autonomy of the wilderness should not focus on protecting as many wildlands as possible, but on destroying the STI. Certainly, if such a movement were to achieve its goal, it is very likely that societies would form that would have a negative impact on wild ecosystems, but none will have (at least in the short and medium term) the destructive capacity achieved by the STI so that, the sooner it disappears, the less damage caused to wild nature and the greater the chances that it can recover.

There are few evaluations that I have been able to find about the effectiveness of EF! when it comes to conserving and protecting wild territories. But from what it seems his successes were very limited; in most cases the only thing they achieved is to postpone or slow down their destruction. Where they do appear to have been most successful is in another of their goals: helping make mainstream conservation groups more effective. According to Taylor, "although it is difficult to assess whether the presence of a radical environmental front increased the effectiveness of mainstream groups, after the formation of EF! some of these groups developed stronger positions, at least in part in response to EF! Several of them also adopted the protection of biodiversity as a central priority, something that had not been common before EF's emphasis! in her. Some mainstream group leaders who publicly criticized the movement's illegal tactics privately acknowledged that, politically, the radicals had played a positive role."¹⁴⁸ So EF! It acted, in part, as a mechanism to repair and improve the system by increasing the effectiveness of groups that do not question the existence of the STI at all and that are in charge of improving the management of the current ecological crisis.

¹⁴⁷ "Wilderness" in the original. *N. from t.*

¹⁴⁸ *Idem. N. of the t.*

9. Some lessons

In the development of any political movement there are aspects that are learned through trial and error, however it is not necessary to experience everything directly, there are things that can be learned by studying and critically analyzing the experiences of other movements. The case of EF! it is especially valuable because, in addition to being quite recent, most of those who founded it and those who were initially involved in it started from some values similar to those defended on this page.

A movement whose fundamental value is the autonomy of wild nature, which is serious about the complete destruction of STIs, must strive to develop a rational, solid and coherent ideology that makes clear the values that impel it to act and its model of understand and explain reality. In this way, the aspects that remain to the free interpretation of those who may feel attracted by the movement are minimized. Phew! completely missed this point, it was enough to share something as vague as: "Earth First!" And, in this way, people were added for whom the Earth was "the first thing" only in their rituals, for whom the Earth was "the first thing" only in their T-shirt, for whom the Earth was "the first thing" always that before patriarchy, capitalism, etc. will end.

In terms of organization, a small movement can afford to function and be, to a certain extent, effective with a very informal and decentralized structure, however, such a structure can pose a serious problem when the movement grows. What is "anarchic", "horizontal" and "diffuse" has its limits and it is important to know them and keep them in mind from the beginning.

A possible mistake that is easy to fall into when learning about the history of EF! it is to think that the movement deviated from its initial goals and ideology because it suffered a leftist invasion. However, as I have tried to explain, that is not entirely true. Phew! It did not suffer an invasion, its initial members threw the doors wide open and encouraged to enter anyone who believed (or claimed to believe) that the Earth comes first.

What happened in EF! it provides a perfect example of one of the functions that leftism fulfills in the STI: to neutralize potentially anti-system movements and transform them so that they promote a kind of rebelliousness and values that are innocuous, or even useful, for the system. It is not enough to make one's values clear in the hope that this will keep leftists away, it is necessary to criticize their values and actively strive to show the profound differences and incompatibilities that separate us from them. Now, we must be clear that the objective is not to put an end to leftism or leftists, but to do away with the ITS Towards its destruction is where most of the forces of those who value above all nature, autonomous and untamed

10. Notes

1. I thank AQ, UR and JH for their comments, suggestions and criticisms of the draft of this text, they have been of great help to me.

2. Conservationism is a very heterogeneous movement, which originated in the US in the final decades of the 19th century, whose objective is the preservation of spaces that exist in the world with little or no humanization in the face of the advance of STI. The values and The motivations of the different people and groups that make it up vary enormously, the intention to conserve such spaces can stem, among others, from the aesthetic, educational and recreational interest that they may have for humans, from the conservation of places potentially rich in resources (water , wood, gas, etc.), the conservation of certain emblematic species (bears, elephants, lions, etc.) or, as in the case of EF! in its beginnings, from the need to maintain large wild ecosystems where evolution can continue its course regardless of the interference of human societies. Quite often, conservationism is confused with environmentalism, however, while the former is concerned with the negative consequences of STIs on wild or less humanized ecosystems (for example, the destruction of brown bear habitat), the latter It does so primarily because of the negative consequences of STIs that affect the environment in which humans live (for example, air pollution in cities). EF members themselves! quite often they used the terms “environmentalist” and “conservationist” as if they were synonyms, although over time those more interested in wild territories became more careful when it came to differentiating between them.

I am aware that the above definitions are not complete and that some of their aspects may be debatable, but a more precise definition of terms such as ”conservationism”, ”environmentalism” or ”environmentalism” would take up a lot of space and would deviate from the purpose of the present text.

3. See in this regard Foreman (1982c), Bookchin and Foreman (1991) or Wolke (2006). Foreman (Bookchin and Foreman, 1991), for example, says: “(...) at the beginning of the Reagan administration, the Sierra Club was said to be a gang of extremist environmentalists. (...) [T]here was a spectrum of debate that went from phony land violators at one end to the 'Big Ten' environmental organizations at the other. So, in an attempt to appear credible, correct and respectable, we conservationists had to move towards the extreme of phony land-raping before we even opened our mouths. The result, of course, was a narrowing of the spectrum of debate, a narrowing that favored the big business developers. Therefore, in EF! we try to create space for the radical environmentalist perspective at the extreme end of the spectrum. And, as a result of maintaining our stance as stalwart and uncompromising lovers of the wilderness bent on sabotage and direct action, I believe we have allowed the Sierra Club and other groups like it to hold stronger stances than ever before and, at the same time , even seem more moderate than ever.

4. In the words of Howie Wolke, one of the founders of EF!, “For me, and for others, the development of a biocentric philosophy regarding the wilderness is the result of

intense contact with the wilderness itself. And more importantly, a deep appreciation for wild places breeds a desire to protect them.” Wolke (1991), page 103.

5. See for example Nash (1967).

6. For a full history of the emergence and development of American conservation thought, see Fox (1981).

7. Not all authors agree on who the founders of EF! were. Some cite three: Roselle, Foreman and Wolke (eg Wolke, 2006), others cite five, but include Susan Morgan of the Wilderness Society instead of Roselle (Foreman, 1991). The list that appears in the text is the most frequent in the bibliography about the history of EF!. According to Lee (1995), page 34, Mike Comola of the Montana Wilderness Association; Randall Gloege from Friends of the Earth; Sandy Marvinney, former editor of the *Wilderness Report*; and Susan Morgan of the Wilderness Society were also influential and involved in the formation of EF!

8. “Yippies” was the name by which members of the Youth International Party were known. In reality, despite its name, the YIP was not a political party in the classical sense, but rather a more or less organized movement that emerged as a result of the politicization and “radicalization” of people from the hippie and countercultural movement. Founded in the US in 1967, the YIP was anti-authoritarian, against the war, a defender of free expression, free love, drug use, etc., and many of its actions were symbolic or theatrical. For their part, the so-called “Zippies” were a faction made up of the younger members of the party that split from the YIP in 1972.

9. There is a Spanish translation: *La Banda de la Tenaza*. Bernice, 2012.

10. See, for example, Liddick (2006), pages 17-18; Zakin (1993), pages 47-70; Manes (1990), pages 184-5.

11. In an interview with Bron Taylor, Roger Featherstone, who was involved in the actions of the Bolt Weevils, states that Foreman and Roselle were already aware of their existence when he first met them in the early 1980s. Taylor (2008).

12. Wolke (2006).

13. Wolke (1991, page 148) writes about it: “Above any other factor, what caused the formation of Earth First! were the atrocious recommendations that emerged from RARE II (...)”.

14. See Wolke (2006).

15. Zakin (1993), page 95.

16. Lee (1995), page 29.

17. Foreman (1981).

18. Foreman (1981).

19. Foreman (1991).

20. Foreman (1981).

21. Lee (1995), p. 39. In an interview with Lee, Foreman states that the last point was a result of his temporary fascination with the writings of the feminist theologian Starhawk and was dropped almost immediately.

22. Some of the terms and ideas in this statement (for example, “paternal hierarchies”, “imperialism” or the Earth goddess) show that, in addition to Roselle, some of the founders of EF! had/had some leftist and countercultural contamination (eg Foreman). In any case, the presence and weight of these types of terms and values in the texts they wrote later are scarce or non-existent, which leads me to think that their use in the declaration is a consequence of ideological shortcomings rather than of ideas and values. own.

23.EF! they always made a great emphasis that it was not an organization, but a movement or a tribe, which is why they discarded the term “member” to refer to those who participated in their activities. Instead, they thought it more appropriate to use the term “Earth First!er”, which would come to mean something like “the one from Earth First!”. In this text, however, I have decided to use “member” instead of “Earth First!er”, first, because of the difficulty of translating the latter and, second, because I believe that his rejection of the term “member” did not pass from being, basically, a semantic question.

24. Foreman (1991), page 3.

25. From a speech by Foreman in Grand Canyon, Arizona, in July 1987. Quoted in Manes (1990), page 72.

26.Foreman (1986b).

27. Foreman (1991), page 217.

28. Howie Wolke at the editorial of *Earth First! Journal* of March 20, 1982. Cited in Manes (1990), page 132.

29. One of the contradictions present in EF! it was the frequent misanthropy and, at the same time, the idealization of primitive societies. It is common to find in the *Earth First! Journal* articles that portray primitive societies as societies that live in harmony with nature, without war, without sexism, etc. For example, Davis (1985) wrote that “in general, primitive peoples seem to have led lives free from many of the restrictions that make modern life unpleasant; restrictions such as tedious work, or artificial notions about right and wrong. Foreman (1983a) wrote: “Initial human society was egalitarian, non-hierarchical, non-dominant. There was no sexism. Children were not dominated” and, in 1989, in a talk at the Sierra Club International Assembly, he said (Zakin, page 398): “Instead of America and Europe showing the rest of the world how to live, we need some Australian Aborigines, Bushmen, Eskimos, Kayapó Indians and Penan come to teach us how to live.”

30.Foreman (1983b).

31. Many conservationists, ecologists and philosophers use the term “biocentrism” to refer to ethics that place the integrity of the biosphere and wild ecosystems as a fundamental value. However, “biocentrism” is also commonly used to refer to ethics focused on the defense of individual life (as, for example, among many of the so-called antispeciesists). Despite the profound differences and incompatibilities between both meanings and the fact that there is another more appropriate term to refer to the first (“ecocentrism”), EF! I always used “biocentrism” and that is why I have used that

term in this text. It is important for the reader to keep in mind that whenever I use "biocentrism", I do so in reference to ethics based on the value of the Biosphere and wild ecosystems and *never* to ethics based on the defense of individual life and rejection of death. It should be noted that the members of EF! were aware of some of the possible confusion with this term, in fact a member of EF! he wrote shortly after leaving the movement: "the term 'biocentrism' is inappropriate (...), since deep ecologists do not place life, *bios*, at the center of their new ethic, but the entire community of living and nonliving entities that make up an ecosystem" (Manes, 1990, page 144).

32. See, for example, Foreman (1987).

33. Deep ecology is a current of ecological thought founded by the Norwegian Arne Naess. He defends a biocentric perspective that considers that nature has an intrinsic value. Unfortunately, the enormous influence exerted by Naess has blunted the potential of deep ecology, which in most cases is profoundly idealistic, reformist, and leftist (see, for example, Devall and Sessions, 1985; for an apt critique of some aspects of deep ecology, see AQ, 2011). There are few texts of deep ecologists published in Spanish, however, interested people can read the translations of the principles of deep ecology elaborated by Arne Naess and George Sessions (Naess, 1986) and of the "foundational" text written by Naess (1973). For a more complete reading on deep ecology, see Sessions (1995).

34. In Devall and Session (1985), for example, a list of "deep ecology action groups" is included, in which EF! is listed as the only "direct action deep environmental group in the United States," p. 257.

35. According to Zakin (1993, page 144), each of these reserves would be approximately 400,000 hectares. Of the protected wilderness areas in the US at the time, only two were, by EF!'s criteria, of sufficient size. In them, EF! "He was only proposing to close one or two roads."

36. Wolke (2006).

37. Lee (1995), page 43.

38. Zakin (1993), page 145.

39. Foreman (1991), page 21.

40. Foreman in an interview with Martha F. Lee, in Lee (1995), page 35.

41. Interestingly, the then leaders of EF! They gave this body this name in Spanish.

42. Foreman in an interview with Martha F. Lee, in Lee (1995), page 59.

43. Lee (1995), page 35.

44. Dave Foreman in *Nature More*, vol. 0, n°0 (July 1980), cited in Lee (1995), page 36.

45. Dave Foreman in *Nature More*, vol. 0, n°0 (July 1980), cited in Lee (1995), page 36.

46. Zakin (1993), page 146.

47. Lee (1995), page 36.

48. Scarce (1990), page 62.

49. The “flyer” they made as an invitation to the first meeting said: “WHY: to reinvigorate, excite and inspire activists for the defense of the wild territories of the West; to return passion, humor, joy and fervor for a goal to the cause; to forge friendships, cooperation and alliances across the West; to drink together, stir up some romance and howl at the moon”. Zakin (1993), page 142.

50. Lee (1995), page 34.

51. Lee (1995), pages 50, 74 and 89.

52. Lee (1995), pages 93 and 121.

53. Zakin (1993), page 145.

54. Foreman in the foreword to Davis’ book (1991), page 7.

55. Foreman in the foreword to Davis’ book (1991), page 9.

56. Foreman in the foreword to Davis’ book (1991), page 9.

57. Foreman (1982b).

58. Foreman in the foreword to the book by Davis (1991), page 10.

59. Foreman (1986b).

60. Lee (1995), page 89.

61. Lee (1995), page 116.

62. In May 1982, EF!, under the Ned Ludd Books imprint, published a manual entitled *Ecodefense: A Field Guide to Monkeywrenching*, in which that Dave Foreman and Bill Haywood compiled and edited various articles and letters on sabotage techniques. Subsequently, two other revised and expanded editions of this manual were published, the last one in 1993.

63. Foreman (1991), page 115.

64. Petersen (1985).

65. See, for example, Foreman (1989a and 1989b) and Wolke (1983a and 1989).

66. Foreman (1991), page 139.

67. Wolke (1983b).

68. Foreman (1983c).

69. See Foreman (2004), pages 158-160.

70. Foreman in a talk at the Sierra Club International Assembly, quoted in Zakin (1993), page 399.

71. Regarding the evolution of EF!, I think it is necessary to clarify that I have barely dedicated space to talking about the immense number of actions, protests, campaigns, etc. carried out between 1980 and 1990. On the one hand, because I think it is not necessary to detail them in order to understand the internal evolution of the movement and, therefore, for the purpose of this article and, on the other hand, because doing so would mean an investment too big of time and space. Those interested can consult the sources cited in the bibliography, especially Lee (1995), also Zakin (1993).

72. Foreman (1991), page 21.

73. “Earth First!: The First Three Years” in *Earth First Newsletter*, vol. 4, n°1, quoted in Lee (1995), page 56.

74. “On the Road Again or The Great Earth First! Road Show” in *Earth First Newsletter*, vol. 1, n°6, cited in Lee (1995), page 48.

75. Manes (1990), page 76.

76. Manes (1990), page 76.

77. Dustrud (1982).

78. Foreman (1982).

79. Wolke (1988).

80. Foreman (1982). Curiously, in *The Monkey Wrench Gang*, one of its protagonists says something very similar: “Let our practice shape our doctrine, that will guarantee us theoretical coherence”, Abbey (1975), page 65 .

81. Foreman (1988).

82. Zakin (1993), page 221.

83. Willow, “Round River Rendezvous Rare Experience”, cited in Lee (1995), page 51.

84. Taylor (2005), page 519.

85. Foreman (1982d).

86. Wolke (1988).

87. Foreman (1991), page 216.

88. Zakin (1993), page 309.

89. Scarce (1990), page 59.

90. With “direct action” I refer in this text to those activities carried out by EF! as a method of dissemination, protest or attack to advance their objectives (general or specific) that generally went beyond legal limits but did not involve the destruction of machinery or other infrastructure. Examples of direct action would be roadblocks, chaining to machinery or *tree-sitting* (see note 96). It is true that sabotage, understood as those actions directed directly or indirectly to the destruction of machinery and infrastructure, is also usually considered a type of direct action. However, for the purpose of this article, because of the importance it had in the founding, growth, and breakup of EF! I have decided to consider it as a separate activity.

91. Zakin (1993), page 356.

92. In summary, the “Nomadic Action Group” consisted of a group of EF! activists, well acquainted with civil disobedience tactics, who were permanently willing to go wherever they were needed to organize and carry out protest campaigns. . Let’s say it would be some kind of group of “professional activists” dedicated to civil disobedience.

93. Dave Foreman, “Around the Campfire” in *Earth First! Journal*, vol. 6, n°1, quoted in Lee (1995), page 89.

94. *Fifth Estate* is a left-wing American publication founded in Detroit in 1965. Initially it had an editorial line closer to the countercultural left but, from 1975, it adopted an anarchist and anti-authoritarian perspective. In the late 1970s and early 1980s, the *Fifth Estate* published many of the essays by John Zerzan, David Watson, Bob Brubaker, Peter Werbe, etc., which would start the trend that years later , would be called anarcho-primitivism.

95. Manes (1990), page 103.

96. The *tree-sitting* or sitting in the trees, is a technique that consists of climbing the trees and, tied directly to them or through the construction of a platform in height, remain on them to prevent or delay their felling.

97. Zakin (1993), page 354.

98. Bari and many others often identify biocentrism and deep ecology. However, while deep ecology implies the defense of a biocentric ethic, biocentrism does not always imply the defense of deep ecology.

99. Bari (1994), pages 219-220.

100. The Industrial Workers of the World is a left-wing union founded in the United States at the beginning of the 20th century. He is known for his emphasis on direct action and the self-organization of workers.

101. Scarce (1990), page 82.

102. Lee (1995), page 119. About the role of women in EF!, Bari (1994, page 220) said that “EF! it was founded by five men and its main spokespersons have always been men. As in all groups, there have always been competent women doing the real work behind the scenes. But they have been practically invisible in the shadow of the public image of the ‘great man who goes into the wilderness to save great trees’.” From the perspective of Bari, women were relegated to the background and suffered some discrimination when it came to actively participating in the movement. However, Scarce and Lee provide two testimonies that clash quite a bit with Bari’s point of view. In an interview with Scarce (1990, page 91), Karen Pickett (Roselle’s wife) said “that she has not perceived opinions contrary to women (...). Even in its first stage (...), when I was the only woman working on an action together with a bunch of men, the group focused on the issues related to said action. There just weren’t any issues about sex or sexism.” For her part, Helen Wilson, in an interview with Lee (1995, page 120), said that “for many [women] in the biodiversity faction, feminist concerns were irrelevant to wilderness conservation and it was frustrating to waste valuable Rendezvous time discussing women’s issues and/or complaining about men: ‘I was upset because I thought: we are here to talk about ecological issues. This is not just a ‘women’s issue’! I found out from my husband, who was with the men, that they didn’t talk about women... They didn’t drop their pants. They talked about the wilderness.’”

103. Shantz (2006), page 45.

104. “Miss Ann Thropy” is a nickname that takes advantage of the meaning of the English word “miss”, which means young lady, to play on words between “Miss Ann Thropy” and “misanthropy”.

105. Manes (1986).

106. Manes (1986).

107. Manes (1986).

108. Manes (1987a).

109. Manes (1987b).

110. Manes (1987b).

111. Manes (1987b).

112. Wolke (2006).

113. Contrary to the FC, within the FJS there were some significant differences. There were from anarchists (close to what today we would call anarcho-primitivists or green anarchists), grouped around the publication *Live Wild or Die* (Live wild or die), who did not reject sabotage and advocated a revolution that end the industrial system; to pacifists advocating nonviolence and practicing Earth-centered religions, such as the Cathedral Forest Action Group; going through workers like the IWW-EF! Local 1, bent on creating a mass ecosocialist movement. Despite these differences, the FJS was united by its leftist values and its opposition to the FC.

114. I do not mean to imply that the place of residence of each member determined the faction of which they were a part. In the FC, there were probably members from Oregon or California and in the FJS from Arizona or Texas. But it does seem that, for the most part, the two factions and, in particular, their leaders tended to group around these two geographical areas.

115. Darryl Cherney shared ideas and a political trajectory with Bari, and they worked hand in hand in organizing many of the actions carried out by the EF groups! from California and Oregon. In an interview with Lee, Foreman said that Cherney had gone so far as to state that he was at EF! "Because that gave him direct access to the media." Lee (1995, page 101).

116. Bari (1994), page 221.

117. Although it seems that, generally, as recommended by *Ecodefense*, the nails were inserted at a sufficient height so that they did not pose a direct risk to those who felled the trees and, furthermore, it was customary to warn the owners of the land or the logging companies that were going to exploit it from the forest areas in which the *tree-spiking* had been carried out, the truth is that, once in the sawmills, the nails they could blow up the saws, creating a significant risk for the workers. However, as far as I know, there was only one accident in which a worker was seriously injured and it is not at all clear that the nails that caused that accident were driven by EF members! (See Foreman [1991], pages 149-152).

118. Bari (1994), pages 264-282.

119. Scarce (1990), 83.

120. "Earth First! Foundation" in *Earth First! Journal*, vol. 4, n°4, 1983, cited in Lee (1995), page 70.

121. "Earth First Foundation Works for YOU" in *Earth First! Journal*, vol. 6, no. 8, 1986, cited in Lee (1995), page 85.

122. "Earth First Foundation Fiscal Report - December 31, 1987" in *Earth First! Journal*, vol. 8, n°4, 1988, quoted in Lee (1995), page 116.

123. The money collected by the foundation was subject to fiscal control that prevented it from being invested in illegal activities (for example, in financing sabotage), however there was no record that collected what the money from the sale was invested in. from the *EF!J*.

124. That Foreman letter is quoted in Lee (1995), page 116.
125. Mike Roselle and Karen Pickett, "Direct Action Fund: The Year in Review" in *Earth First! Journal*, vol. 9, n°4, 1989, quoted in Lee (1995), page 125.
126. John Davis, "A View of the Vortex" in *Earth First! Journal*, vol. 8, n°7, 1988, cited in Lee (1995), page 122.
127. John Davis, "A View of the Vortex" in *Earth First! Journal*, vol. 8, n°7, 1988, cited in Lee (1995), page 122.
128. Scarce (1990), page 89.
129. Zakin (1993), page 410.
130. Foreman (1987), published on this very page, is a good example of this.
131. Lee (1995), page 115.
132. Bari (1994), cited in Shantz (2006), page 51.
133. Throughout 1987 and 1988, as a result of some of his anti-immigration and allegedly sexist articles, Edward Abbey had received much criticism from the FJS.
134. Zakin (1993), page 336.
135. Period during which he wrote most of his book *Wilderness on the Rocks*.
136. Indeed, according to Zakin (1993), p. 329, "beginning in 1982, [the FBI] made regular reports about EF!"
137. They later changed the name of this organization to The Wildlands Network.
138. John Davis, "The Successors of EF!J" in *Earth First! Journal*, vol. 11, n°1, 1990, cited in Lee (1995), page 143.
139. Bari (1994), page 59.
140. See, for example, Karen Pickett, "Breaking Up or Breaking Apart?" in *Earth First Journal*, vol. 11, n°1, 1990, cited in Lee (1995), page 142.
141. Foreman and Morton (1990).
142. In an article published in 1987, WJ Lines lamented that EF!, like American society in general, made the mistake of "valuing activism over thinking and pragmatism over planning." Lines (1987).
143. Stoddard (1986).
144. See, for example, Foreman (1983b).
145. Manes (1986).
146. Manes (1986).
147. Zakin (1993), page 292.
148. Seed (1985).
149. Wolke (2006).
150. Foreman (1982a).
151. Zakin (1993), page 299.
152. Bari (1994), page 220.
153. Foreman (1986a) himself had written, under the pseudonym Chim Blea, an article in which he stated that "there are fundamental differences between the [Deep Ecology and Animal Rights] movements. (...) With such differences I do not see a possibility of completely uniting Deep Ecology and Animal Rights. There will be serious

differences about various issues and what we take as priorities. One wonders why, knowing these differences existed, he would welcome animal rights advocates to EF!

154. Dave Foreman, "Welcome to Earth First!" in *Earth First! Journal*, vol. 5, n°5, quoted in Lee (1995), page 86.

155. Bari (1994), pages 58-59.

156. Alien Nation (1987).

157. Wall (1999), page 45.

158. Consider, for example, the largest legally protected wilderness area in the United States, the Arctic National Wildlife Refuge, which occupies 7.9 million hectares. It is likely that there are large amounts of oil and gas in its subsoil, after the zenith of oil production has been exceeded and in a context of energy crisis, will said territory remain untouched by human activities?

159. Taylor (2005), page 2562.

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12. Final Note

Whenever I have been able, I have tried to consult the direct sources arising from the movement itself or from its members (articles, publications, letters, memoirs, etc.), however, it has been impossible for me to consult most of the original content published in the *EF!J* between 1980 and 1990. For this reason, it is possible that there are some relevant issues that you do not know and, therefore, are not included in the text. In any case, to try to alleviate this deficiency, I have resorted to several books on the history of EF! written by people who did not participate in the movement (mainly sociologists, political scientists and journalists).

PRESENTATION OF THE EXTRACT OF THE LETTER TO DAVID SKRBINA OF SEPTEMBER 18, 2004

Often, in conversations or debates about the disaster that the development of civilization, in general, and industrial society, in particular, have brought to the autonomy of the wild, the questions end up arising, in one way or another: “And what can be done?”, “How can the techno-industrial system be effectively combated?”. Natural and sensible questions, with difficult answers. Of course, there is no simple, straightforward answer. The answer is not to go straight for the central target, the techno-industrial system, hoping to do away with it immediately or in a few steps. Today, we cannot seriously damage the system by acting directly against it. The answer must necessarily refer to a complex, indirect and longer-term process (although we do not know how long, or even if there is enough time already), with various phases or stages, a good part of which would involve carrying out activities aimed at the mere preparation to be able to advance towards later stages. But neither is the answer that is often given, usually thinking only of an immediate, direct and simple attack on the system: “there is nothing we can do”. The latter is false. There is a possibility, perhaps unlikely and certainly not easy, but it exists. This possibility is discussed in the text by Ted Kaczynski that follows. As he himself acknowledges, all the details and concrete steps to take may not be clear yet, but the general idea of how to act and where to direct the activity is very clear.

EXCERPT FROM THE LETTER TO DAVID SKRBINA OF SEPTEMBER 18, 2004

By Ted Kaczynski[a]

[...] I think [...] it would be a good idea to offer a more detailed summary of how I see the “road to revolution”. Said “path” is, of course, speculative. It is impossible to predict the course of events, so any movement that aspires to get rid of the techno-industrial system will have to be flexible and proceed through trial and error. It is,

however, necessary to offer a *provisional* indication of the route to follow, since if you have no idea where you are going, the movement will lurch aimlessly.

Also, a summary of at least one *possible* route to revolution will help to show that the idea of revolution may be possible. Probably the biggest obstacle to building an effective revolutionary movement today is the mere fact that most people (at least in the United States) don't see revolution as a realistic possibility.

First of all, I believe that illegal actions will be indispensable. If it seemed that I was trying to incite others to illegal actions, I would not be allowed to send this letter, so I will only say the following on this matter: a revolutionary movement must be made up of two different and separate sectors, one illegal and underground and one legal. I will not say anything about what the illegal sector should consist of.

The legal sector (if only to protect itself) should carefully avoid any contact with the illegal sector.

With the possible exceptions listed in my letter of 8-29-04[b,c], [...] the role of the legal sector should not be to correct any of the specific problems caused by technology. For him

[a] Translation of Último Reducto from the original handwritten letter in English. This letter was later published in Theodore J. Kaczynski, *Technological Slavery*, Feral House, 2008, pages 266-273. ©Copyright for the English original, Theodore John Kaczynski, 2004. © Copyright for this Spanish translation, Último Reducto, 2017. *Translator's note.*

[b] © for the original letter in English, Theodore John Kaczynski, 2004.

[c] Excerpt from Ted Kaczynski's letter to David Skrbina dated 8-29-04 in which said exceptions are mentioned: on the contrary, their function should be to prepare the way so that a future revolution can be carried out when the appropriate moment arrives .

Such prior preparation is especially important because the occasion for revolution can come at any time and quite unexpectedly. The spontaneous insurrection of 1917 in Saint Petersburg took all of Russia by surprise. It is fairly safe to say that such an insurrection (if it actually occurred) would have amounted to nothing more than a futile and massive explosion of frustration if the path to revolution had not been previously prepared. When it happened, there was already a strong revolutionary movement with the capacity to provide leadership, and furthermore, the revolutionaries had long been educating (or indoctrinating) the workers of St. Petersburg, so when the latter rose up they were not merely expressing their anger in a thoughtless way, but they were acting orderly, with a purpose and in a more or less intelligent way.[1552]

To prepare the way for revolution, the legal sector of the movement should:

1. Become stronger and maintain internal cohesion. Increasing the *number* of members will be less important than recruiting loyal and capable members, who are deeply committed to the cause and ready for practical action. (The example of the Bolsheviks is instructive in this regard[1553]).

2. Develop and spread an ideology that:

- a) Show people the many dangers that advancing technology poses for the future.
- b) Show people how many of their problems and frustrations are a product of living in a technological society.
- c) Show people that there have been societies in the past that, to a greater or lesser extent, have been devoid of these problems and frustrations.
- d) Offer as a positive ideal a life in contact with nature.
- e) Present the revolution as a realistic alternative. [See Note 3].

The utility of 2 is as follows:

As things stand at the moment, revolution is impossible in the stable areas of the industrialized world. A revolution can happen only if something happens that shakes the stability of industrial society. It is easy to imagine events or processes that cause the system to falter in this way. To take just one example, suppose a virus created in an experimental laboratory escaped and killed, say, a third of the population of the industrialized world. However, if that were to happen *now* it seems unlikely that a revolution would result. Instead of blaming the disaster on the techno-industrial system as a whole, people would blame only the recklessness of a particular laboratory. Their reaction would not be to eliminate the technology for good, but to try to pick up its pieces and get the system back on track—although laws would no doubt be passed requiring much tighter control of biotech research in the future.

The difficulty is that people see problems, frustrations and disasters as isolated phenomena instead of seeing them as manifestations of the central problem that is technology. If Al Qaeda were to blow up a nuclear device in Washington, DC, people's reaction would be: "Get those terrorists!" People would overlook the fact that the bomb could not have existed without the prior development of nuclear technology. When people see their culture or economic well-being disrupted by mass immigration, their reaction is to hate the immigrants rather than take into account the fact that mass population movements are the inevitable consequence of economic development which in turn Perhaps it is the result of technological progress. If there is a global economic crisis, people will merely blame it on someone else's economic mismanagement, ignoring the fact that, where in the past small communities were largely self-sufficient, their well-being did not depend on the decisions of the government's economic experts. When people are disgusted by the decline of traditional values or the loss of local autonomy, they rail against "immorality" or anger at the "central government," respectively, seemingly unaware that the loss of Traditional values and local autonomy are inevitable consequences of technological progress.

However, if a revolutionary movement could show enough people how the above problems and many others are all consequences of a single central problem, that is, technology, and if such a movement could successfully carry out the rest of tasks listed in (2), then, in the event of an event that shakes the system, such as the epidemic mentioned above[1554], a global economic crisis or an accumulation of various factors that return the difficult or insecure life, a revolution against the techno-industrial system would be possible.

Furthermore, the movement does not have to wait passively for a crisis that weakens the system. Leaving aside the activities of the illegal sector, the opposition shown by the legal sector of the movement can help to produce a crisis. For example, the Russian Revolution was favored by the military disasters suffered by the tsarist regime in the First World War. And the revolutionary movement may have helped bring about such disasters since "[i]n no other of the contending countries did political conflicts play such an intense role during the war as they did in Russia, preventing the effective mobilization of the rear." [1555]

The movement will have to make use of rational arguments to carry out the tasks described in (2), of course. But as I already pointed out in my letter of 8-29-04 [...] reason alone is an ineffective tool when it comes to influencing the behavior of the masses. [d] You will also have to take advantage of the non-rational human behavior. But, for this, it will not be able to rely on the propaganda techniques of the system itself. As I explained in my letter of 8-29-04 [...], the system cannot be defeated in a direct propaganda confrontation.[e]

On the contrary, the movement will have to elude the superiority of the system's psychological weaponry by making use of certain advantages that a revolutionary movement has over the system. Some of these advantages would be:

(i) Apparently many people feel that there is a kind of spiritual vacuum in modern life. I'm not sure exactly what this means, but "spiritual emptiness" would include at least the apparent inability of the system to provide any widely accepted positive value other than hedonism or the simple glorification of technological progress itself. Evidence that many people find these values unsatisfactory is provided by the existence within modern society of groups that offer alternative value systems—values that sometimes conflict with those of the system. Such groups would include fundamentalist Christian churches and other smaller and even more unconventional sects, as well as minority political movements and extremists on both the left and right.

A revolutionary movement that wants to succeed would have to do much better than these groups and fill the spiritual vacuum created by the system with values that serve to attract rational and self-disciplined people.

(ii) Wild nature still fascinates people. This is seen in the popularity of magazines like *National Geographic*, of tourism to the (semi)wild places that still remain, and the like. But despite all the nature magazines, wilderness tours, parks and reserves, etc., the establishment's propaganda is unable to hide the fact that "progress" is destroying wilderness. I think many people still view this as seriously disturbing, and not just because of the practical consequences of environmental destruction. And his feelings on this matter provide a tool that a revolutionary movement can use.

(iii) Most people feel a need to feel part of a community, or to belong to what sociologists call a "reference group." The system tries to fill this need as much as possible: some people find their reference group in a mainstream Christian church, a boy scout group, a "support group" or the like. Many people find these system-provided reference groups unsatisfactory, as evidenced by the proliferation of independent groups

that are outside the mainstream or even contrary to it. These include, among others, eccentric sects[f,g], gangs and dissident political groups. Possibly the reason many people find the reference groups provided by the system unsatisfactory is the very fact that these groups are appendages to the system. People may need groups that are “their thing”, that is, that are autonomous and independent of the system.

A revolutionary movement should be able to form reference groups that offer more satisfactory values than the hedonism of the system. Wild nature could perhaps be the core value or one of the core values.

In any case, when people belong to a close-knit reference group, they become very immune to systemic propaganda that conflicts with the values and beliefs of that group.

“ Propaganda” offers a good insight into the technical underpinnings of modern propaganda, and thus gives an idea of the enormous amount of money that would be needed to achieve even the slightest influence on [people’s behavior] through persuasion. ‘Many of the largest and wealthiest propaganda agencies ... design ‘token campaigns’ and ‘image building’ operations by mathematical calculation, using amounts of data that can only be processed by computers ...’ (*Encyclopaedia Britannica*, 15th edition, 1997, Volume 26, article “Propaganda”, page 174.), etc., etc. (This should be enough to demolish your suggestion that ‘propaganda can be fought by counterpropaganda’ [...] Unless you have many billions of dollars at your disposal, there is no way to beat the system in one go.) direct propaganda confrontation. A revolutionary movement will have to find other means of causing an impact on the system).

N. from trans.

[f] “Cults” in the original. *N. of the trad.*

[g] The ‘cults’ are small religious groups whose beliefs or behaviors are not very compatible with the values of the techno-industrial system. *Note from Ted Kaczynski*. Original in Spanish. reference group.¹ The reference group is, therefore, one of the most important tools that a revolutionary movement has in order to defeat the propaganda of the system.

(iv) Since the system needs a docile and orderly population, it must strictly contain aggressive, hostile and violent impulses. There is a lot of anger against the system itself, and the system needs to keep this kind of anger under especially tight control. Therefore, suppressed rage is a powerful psychological force that a revolutionary movement should be able to use against the system.

(v) Since the system is based on cheap propaganda and requires a willful blindness to the bleak outlook offered by continued technological progress, a revolutionary movement that develops its ideas carefully and rationally can gain a decisive advantage by having reason on its side. . I have pointed out before that reason *by itself* is a very ineffective tool for influencing the masses. But still, I think that in the long run a movement can greatly benefit from establishing its fundamental ideas on a solidly rational basis, as long as it pays close attention to the non-rational aspects of human behavior.

¹ A couple of examples:

In this way the movement will attract rational and intelligent people who are repulsed by the propaganda of the system and the distortion of reality that it entails. Such a movement may attract fewer people than one based on a crude appeal to the irrational, but I submit that a modest number of high-quality people will achieve more in the long run than a large number of fools. Keep in mind that rationality does not exclude a deep commitment or a strong emotional involvement.

Compare Marxism with the irrational religious movements that have appeared in the United States. Religious movements achieved little or nothing that was significant and lasting, while Marxism shocked the world. Marxism, certainly, also has its irrational elements: in many people the belief in Marxism fulfilled a function equivalent to religious faith. But Marxism was far from totally irrational, and even historians today acknowledge Marx's contribution to understanding the effect of economic factors on history. Seen from the perspective of the 19th and early 20th centuries, Marxism was a plausible and highly relevant theory for dealing with the problems of the time, so it attracted people of a completely different kind from those who were attracted to religious movements. .

It is possible, however, that faith in Marxism, understood as dogma, played an essential role in the success of the Russian revolutionary movement. Years ago I read somewhere that Lenin himself did not dogmatically believe in the Marxist doctrine, but that he nonetheless did not see fit to question the faith of the dogmatists², and I suspect that the same must have been true of the Marxists. most rational and intelligent of the time of Lenin. Perhaps a movement should not try to impose too rigid a rationality on its followers, but should leave room for faith. If the ideology of the movement has an underlying rational basis, I suppose that it should be able to attract rational and intelligent people, even if that ideology has a certain amount of non-rational or irrational superstructure. This is a sensitive question and the answer to it can only be obtained by trial and error. But even so, I still maintain that giving a broad rationale to its positions will give the movement a powerful advantage over the system.

In any case, the type of people who constitute the movement will be of decisive importance. The biggest mistake such a movement could make would be to assume that it should have as many members as possible and to encourage anyone who might seem interested to join it. This was exactly the mistake the Earth First made! original. When it was formed in the early 1980s, such an organization could have contained the germ of a genuine revolutionary movement. But he indiscriminately invited anyone who approached him to join him; and - of course! - most of those who approached him were left-leaning figures. These numerically saturated the movement and took control, changing its character. The process has been documented by Martha F. Lee in *Earth First!: Environmental Apocalypse*, Syracuse University Press, 1995.[h]

² For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

I don't think that Earth First!, as it is constituted *now*, is already a potentially revolutionary movement. The green anarchist or anarcho-primitivist movement, in addition to attracting left-leaning individuals, manifests another kind of problem as far as its members are concerned: it has attracted too many elements who suffer from mental disorders and show a serious deficiency of self-control, thereby the movement as a whole has an irrational and sometimes even childish character. Because of all this, I believe that such a movement is doomed to fail. Actually the green anarchist or anarcho-primitivist movement has some very good ideas and I think that, in a way, this movement has hit the nail on the head. But the movement has been blighted due to the influx of the wrong kind of people.

So one of the critically important problems facing a fledgling revolutionary movement will be keeping out leftist individuals, disorganized and irrational elements, and any of the other undesirables who will flock to any rebel movement that arises in [the present].

Probably the hardest part of building a movement is just taking the first step: you have to assemble a handful of the right kind of people and strongly committed. Once that small nucleus has formed, it should be easier to attract new members.

One thing to keep in mind, though, is that no group will attract or retain members if it's no more than a discussion group. If you want to keep people interested, get them involved in hands-on projects. This is true whether the movement to be constituted is revolutionary or merely reformist.

The first project of the initial handful of people would be bibliographical research, as well as the search for information by other means. Information that should be sought would include, for example, historical data about how social changes have occurred in past societies and about the evolution of political, ideological, and religious movements in those societies; information about the development of these movements in our own society throughout the last decades; the conclusions of academic studies on collective behavior; and data concerning what kinds of people have been involved in Earth First!, green anarchy, anarcho-primitivism, and related current movements.

Once the group has collected enough information, they could design a tentative program of action, perhaps modifying or discarding many of the ideas I have outlined above.

Be that as it may, for those who seriously want to do something about the problem of technology, the first task is quite clear: form the nucleus of a new movement that keeps itself strictly separate from the leftists and the irrational characters that infest the current anti-tech movement [...]

Grades

1. Leon Trotsky, *History of the Russian Revolution*, [1956]³ translated by Max Eastman, 1980, Vol. One, Chapter VIII, pages 136-152.

2. See Trotsky, *op. cit.*, or any history of Russia during that relevant period.

3. It must be admitted that (2) is not exactly identical to the second objective of a revolutionary movement that I listed in [...] my letter of 8-29-04: "Increase the tensions within the social order until those tensions reach the breaking point. But one thing I've learned about expository writing is that too much precision is counterproductive. [In order to be understood, one has to simplify as much as possible, even at the cost of precision. To achieve the purpose of my letter of 8-29-04, what I needed to emphasize was that a revolutionary movement has to increase social tensions rather than alleviate them through reforms. If I had given a more detailed and precise description of the tasks that a revolutionary movement should perform, as I have done in this letter, it would only have diverted attention from the point I needed to make in my letter of 8-29-04. So I beg your indulgence for not being perfectly consistent on this occasion.

4. The suggestion that a biotechnological accident could serve as a trigger for revolution conflicts with my previous suggestion (letter of 8-29-04 [...]) that it might be desirable to slow the progress of biotechnology from so that any biotechnological catastrophe is postponed. On the one hand, said catastrophe could become so serious that after it there would be nothing left to save; on the other hand, a less serious catastrophe might offer the occasion for revolution. It is debatable which of the two possibilities should be given more importance. But on the whole I think it would be best to try to slow down the progress of biotechnology.

5. *The New Encyclopaedia Britannica*, 15th edition, 2003, Volume 28, article "Union of Soviet Socialist Republics", page 1000.

6. *Ibid.*, Volume 26, article "Propaganda", page 176 ("as a rule the most effective media... are not the impersonal mass media but rather those few associations or organizations (reference groups) with which the individual feels identified... Quite often the common man not only avoids but actively distrusts the mass media... however, in the warmth of his reference group, It feels like home...").

7. Here, the usual warning about the unreliability of my memory.

³ There is a Spanish translation: *History of the Russian Revolution*. Zero (1974). *N. of the trad.*

THE LIMITS TO GROWTH AND THE BIODIVERSITY CRISIS.

By Eileen Crist[a]

If the world's air is clean for humans to breathe but there are no birds or butterflies in it, if the world's waters are pure for humans to drink but contain no fish, crustaceans, or diatoms, have we solved our problems? environmental? Well, I suppose so, at least as environmentalism is generally conceived. That clumsy, mistaken and presumptuous formulation, "the environment", implies perceiving the air, water, soil, forests, rivers, swamps, deserts and oceans as a mere environment on which there is something important: the human life, human history. But, in fact, what it is about is not an environment; it is from a living world.

David Quammen

After the publication of the book *Population Bomb* (1968) by Paul Ehrlich and the Club of Rome book *Limits to Growth* (Meadows *et al.* 1972), many environmental analysts have said that the assumption of infinite growth on a finite planet is irrational and dangerous. They have argued that neither the human population nor the world's economic productivity can continue to grow without implying scarcity — of sources of energy, materials, water, and soil. And the constraints are not only imposed by finite resources, but also by the limited capacity of the planet to absorb the waste production of a huge and growing population. Advocates of limits to growth cannot predict exactly when, or how, industrial civilization—and with it all of humanity—will be cornered by its stubborn commitment to infinite growth, but ecological models make it clear that, once breached limits, exceeding carrying capacity[b] and collapse are almost inevitable (Meadows *et al.* 1992).

For as long as there have been arguments in favor of limits to growth, there have been detractors of them, known by the nonchalant name of "cornucopians"[c]. The most famous of these is the late economist Julian Simon. For the Cornucopians, there are no finite limits to the Earth's resources or absorptive capacity. They say that if "finite limits" were a true category, then they should be measurable. Instead, according to his argument, the quantity of any given resource is not absolute: we cannot be sure that there are no hidden treasures of a resource waiting to be discovered—a discovery that could change its quantitative profile; the quantity of a resource depends on the technologies that extract and process it - more efficient technologies change the "quantity" of a resource; recycling it can prolong its life, or make it last indefinitely; our interest in a given resource depends on the uses and services it provides, so that if it can

be substituted by another resource or by a synthetic substitute, then the question of its depletion is irrelevant; and finally, in outer space is where "the limit is", there are future possibilities such as hydroponic agriculture in spacecraft and extraterrestrial mining (see Simon 1999; Kahn *et al.* 1976). Cornucopians—also known, understandably, as "technological optimists"—conclude that the idea of finite limits is a pipe dream. When it comes to resources, the key is not in a set of natural materials or limiting variables, but in human ingenuity, which they consider the "ultimate resource" (Simon 1996).

Limitations of the debate

In crucial respects, the debate between the limit-to-growth advocates and the Cornucopians has nothing to do with the ecological crisis, especially as it pertains to the plight of non-humans, and is, moreover, a digression. The fundamental question is not the dilemma about the limits of the real world, but in *what kind* of real world we want to live. I make two points: (1) that the biodiversity crisis is essentially circumvented in the limits to growth scheme; and (2) that what is hateful about the cornucopian perspective is not that it is (necessarily) stubborn, but the grim reality that it foresees and would establish on Earth.

According to estimates by the Club of Rome in the early 1970s, the time available to avoid a "monumental crisis" was a matter of years, not decades (Elichirigoity 1999). It is quite possible (but not certain) that at some point in the future a key threshold of biophysical limits will be breached with unexpected, dramatic, and perhaps apocalyptic consequences on humanity's unsustainable economic achievements and population growth. But we cannot wait for Nature to come to our rescue or fear the uncontrollable forces that we may unleash. It is essential to focus on what is absolutely true today: that overproduction and overpopulation are the causes of the dismantling of indigenous life and complex ecosystems, and that, in their expansion, they leave behind artificial environments, simplified ecologies and vanished life forms.

So, a key problem with the way the debate has developed is that it refers to *future outcomes*—be they catastrophes or possibilities. The (im)possibility of a large-scale ecological crisis caused by growth is set in the indeterminate future. The limits-to-growth environmental literature falls into this trap of future-focused thinking—it is replete with foreshadowing of things to come: "humanity is near the limits," "dangerous times are coming," or "soon we will see [this and that]."

But from today's ecological perspective, such an approach is counterproductive, if only because tomorrow is such an elusive idea. Although it appears to be a referential concept—similar to "today" and "yesterday"—"tomorrow" is something empty: it never comes, so it essentially refers to nothing. What always arrives is today and in this madly fast world each today is ecologically poorer than its yesterday. Instead, directing attention to possible future disasters can subtly change the way in which the present is experienced and understood. As long as the litmus test of the reality of an ecological crisis is in the future, we will become immune to seeing that we are immersed in it, here and now.

The ecological crisis has many facets but none of them is more urgent, or more fundamental, than the biodiversity crisis. The idea of biodiversity has sometimes been seen as imprecise and politically biased—deeply misguided assessments. Far from being imprecise, “biodiversity” is inclusive at all levels: from genes, through species (as well as subspecies, varieties, and hybrids), populations, ecosystems, and biomes, all the way to processes of ecological interconnectivity and evolutionary speciation. All of them are dimensions of biodiversity: a plurality of states and living processes, biological reality and potential, which make the concept exquisitely versatile, global and robust. Furthermore, the view that “biodiversity” and the “biodiversity crisis” are politically biased—cleverly constructed with the aim of materializing problems in order to influence policy—is narrow-minded. Only those focused exclusively on human affairs, and thus with contradictory interests, would confuse with *politics* the intensity and authority that infuses scientific discourse about biodiversity.

The various components of biodiversity, which are currently being elucidated, require hundreds, thousands, millions or billions of years to reach an impressive level of complexity and dynamism. The destruction of life that conservation biologists call a “biodiversity crisis” refers to the global, human-caused events of extinction, population contraction, limitation of the natural range and movement of organisms, erosion genetics, destruction and degradation of ecosystems, habitat fragmentation, evolutionary paralysis of complex life and disappearance of wild territories. Observing the whole, we are —today— about to inaugurate a *biogeological era* with a decimated biota. But there is still time to mitigate the worst consequences of this global simplification.

Does the scheme of the “rupture of the limits”, face the transcendental event of the crisis of biodiversity? Probably not. It is entirely possible that a mass extinction of fifty, sixty percent, or an even higher percentage of Earth’s species would not, in practice, be catastrophic for humans. Such destruction would forever dwarf the possibilities of improving and prolonging human life through uninvestigated drugs, unknown products, and new food sources—not to mention the disappearance of a great wealth of knowledge and beauty. But the loss of unexplored possibilities is not the same as the violation of limits. And psychologically speaking, human beings only experience loss painfully in relation to what they have been dispossessed of, not in relation to what they have never known. If a mass extinction occurs, humans will experience a loss of a magnitude they do not yet understand; that pain, however, will not have to do with the loss of a cure for the common cold.

If biodiversity continues to decline daily on a global scale, the inevitable consequence will be the large-scale transformation of the planet into a human satellite of artificial, managed, and technological landscapes. Again, the issue of boundary violation is potentially moot. For example, the modification and destruction of countless European, North American and Asian ecosystems has not been catastrophic for their human inhabitants: on the contrary, the appropriation of the wealth of Wild Nature has been the source (profoundly ignored) of the so-called “prosperity”. . From a limits-to-growth perspective, delays in the consequences of destruction are precisely those

that can lead to exceeding carrying capacity—so it should not be assumed that such delays will not have extreme future consequences for humans. Even if this reasoning were correct, again, it is problematic in defining ecological calamities as a potential future state. Focusing on the future, moreover, may not only implicitly normalize the present, but also make evaluation of the present state dependent on whether a future “monumental crisis” occurs. If no such crisis occurs, should one conclude that the complete modification of the biosphere to serve unbridled human materialism is a good thing?

Realistically, it is possible for the Earth to be colonized by *Homo sapiens* without violating the basic conditions that allow the survival of the human species. Let’s consider some possibilities. Natural forests could be replaced by reforestation — even genetically modified to absorb more carbon dioxide and reach maturity faster. Degraded crop fields could be re-cultivated if seeds designed to grow in them were used; a major assimilation of the rational methods of agroecology, such as composting, crop rotation and mixing, could breathe some life into depleted soils. Depleted fishing grounds and extinct fish could be replaced by the launch of large-scale aquaculture to provide protein for humans. Water scarcity problems could be managed through rationing, more efficient technologies, or huge engineering projects like seawater desalination.

In short, on the face of the Earth, the original services provided by wild Nature could be massively modified—and replaced—by engineering initiatives applied to Nature in order to sustain life artificially. Although compared to today’s world, no matter based on what ecological parameter, such a world would be a wasteland, it might be able to *physically* support human beings, perhaps even large populations. So, while the limits-to-growth debate continues to question whether or not a future collision with biophysical limits is real or not, one may lose sight of the slow-motion avalanche that is “wiping out” the natural world, quoting the poet, not with a bang but with a whimper.

The pleas of the limits to growth discourse to maintain the “natural capital” of the world in order to, collecting their “interests”, satisfy human needs also leaves aside the plight of biodiversity. The function of capital is to generate wealth for its owners, shareholders and consumers; By analogy, the function of natural capital is to generate wealth for people. Even ignoring the anthropocentrism present in the identification of the natural world as capital, the expression “natural capital” does not establish or determine exactly what biological wealth should be like to be sustainable. Extensive tree cover (rather than old and/or mature forest) is clearly definable as natural or biological capital—not only is it a source of wood products, but it also produces oxygen and absorbs carbon dioxide, if planted it can successfully reduce erosion on unstable ground, and could even act as a refuge for wild animals and have other critical functions. Salmon with growth-accelerating genes embedded in their DNA—quickly fattened for slaughter—could also be considered biological capital: this genetically modified variety can be harvested in 18 months instead of three years (Turner 2001), generating thus “interests” faster than the “natural capital” generated by wild and free varieties of salmon.

To argue that “natural capital” needs to be maintained for human survival and well-being is not an ecological argument and is not necessarily related to the conservation mission. Deep down, this way of conceptualizing the biological world can —despite the best of intentions— reinforce the cornucopian worldview for which nature is nothing more than a source of raw materials to be exploited and used for the production of wealth. . It should come as no surprise that tech optimists began waving the “natural capital creation/conservation” flag; language based on “capital” and its “interests” easily leads to the assumption of the ideology of free market humanism.

Beyond the limits

In conclusion, the limits to growth scheme is inadequate to face the main crisis of our days: (1) because it is possible that a mass extinction could take place without endangering the survival of the human species; and (2) because the human population could be maintained by a biota managed to satisfy the services and products necessary for human life. So the crucial question is not whether a colonized world is viable, but who (besides Simon and company) wants to live in a world like that? Exposed to a portrait of a planet largely stripped of indigenous ecosystems, wildlife and wilderness, people could wake up and see the inhospitable world coming to fruition.

If, as Edward O. Wilson has eloquently maintained, biophilia[d] is innate to the human soul, then devastating the biosphere is comparable to being unfaithful in love. That betrayal is what lies at the heart of the biodiversity crisis. There are certain ways in which this idea can be harped on quickly becoming sentimental, however there are other ways of showing it that make more people aware of it in the present. One is to be as clear and precise as possible about the consequences of the humanized order under construction: in this emerging reality, it is not our survival and well-being that are at stake, but those of *everyone else* .

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[d] The “biophilia” hypothesis refers to the innate emotional relationship of human beings towards other living beings. It was popularized by biologist Edward O. Wilson in his book *Biophilia*. Wilson et al. suggest that certain human tendencies (for example: the desire to live near lakes or oceans, the aesthetic taste for grasslands or open forests, or the affection towards other mammals) have their origin in human evolution. During 99% of it, humans lived in hunter-gatherer bands that evolved closely with other species. Such adaptation would be reflected in a set of “rules” that would guide human responses towards nature, these responses could range from the excitement and reward caused by hunting for food or fur to the fear of being attacked by large predators, from the satisfaction or the pleasure of eating certain fruits to the fear of poisoning by consuming others. According to the biophilia hypothesis, as language and culture developed, animals and plants provided the symbols, metaphors, and myths that mediate between learned behavior and sensations. For Wilson and Stephen R. Kellert, the brain “evolved in a biocentric world, not in a world regulated by machines”, therefore, for their survival and for the maintenance of their mental health, humans need to be in

contact with the environment environment in which they evolved and in which culture developed. *N. of the trad.*

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TECHNOLOGICAL DEVELOPMENT AND THE ENERGY FACTOR

By J. C.

“When the global peak in oil production is reached, there will still be plenty of oil on Earth; at that point as much will be recoverable as has been mined from 1859 to the present. But every year thereafter it will be impossible to find and pump as much oil as the year before.”¹

PART I:

Peak oil is a concept that has come to the fore with some frequency in recent years for different reasons and in different media. Basically, this concept at a global level refers to the point at which approximately half of the existing recoverable oil would have been exhausted. Since the extracted oil is the easiest to exploit, since it is the easiest to access, half would remain. Of this, a part could be exploited through current or future technologies, although with diminishing margins of energy efficiency; and another very considerable one is not, since, even if it could be done technically, it would not be energetically effective because exploiting that energy in the form of oil would require an energy equal to or greater than that obtained. The concept of EROI (Energy Return Rate), and this is what I was referring to as “energy effectiveness margins”, rates the effective performance in the form of a proportion of surplus or loss of an energy resource in a specific situation; for example, in *“Environmental Accounting, Energy and Decision Making”*² (1996) and in *“Energy and the US Economy: a Biophysical Perspective”*³ (1984), both published in the United States, oil imported by that country in that period was assigned an average EIRR of between 11.1 (1984 report) and 8.4 (1996 report), depending, of course, also on the origin of said oil (that is, between 8.4 and 11.1 units of energy obtained for each unit of energy used to obtain said oil -invested in exploration, drilling, construction of platforms, transportation, etc.-). In these same reports, their authors indicated that in the period from 1950 to 1970, this oil had an average TER

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

of 40 units obtained for each unit used to obtain it. They also say that the discoveries of new deposits prior to 1950 had, in their initial phase of exploitation, an average EROEI slightly higher than 100 and this was reduced to 30 in the deposits found in the 1970s in that same initial phase.⁴

Perhaps the most famous of those who have contributed to the concept of "Peak Oil" has been M. King Hubbert; This American geophysicist worked in various government agencies in his country dedicated to carrying out geological studies in relation to energy. He was a professor of geology at Columbia University, although his main job was to direct the research laboratory of the Shell Oil Company⁵ in Houston, a role he held between 1943 and 1964. With the data that he and other colleagues were collecting, based on on estimated reserves and the life profile of typical oil deposits, he developed a graph model that has come to be known over time as "The Hubbert Curve." Going to what interests us, by means of this system he predicted in 1956 that the peak of US national oil production would take place between 1966 and 1972. The real peak of that oil took place in 1970 specifically, although it was not perceived until a year later. Making this calculation globally is much more complex and risky, but based on the data collected by him and his colleagues and using the same formula, he calculated that peak world oil production would be reached sometime in the last few years. from the 1990s to the 2000s. Since Hubbert's death in 1989, several leading hydrocarbon geologists have used their own versions of the method to update their predictions of peak oil. Having updated the data on reserves and production rates, the results diverge very little from that reported by Hubbert and his colleagues. Colin J. Campbell⁶ places this peak around the year 2008; Kennet S. Deffeyes⁷ places it between 2003 and 2009; the late LF Ivanhoe⁸ places it between 2000 and 2010, as does Walter Youngquist⁹.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

⁷ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other

Undoubtedly there will be people who take away the reason of all these people. In any case, it must be recognized that all of them are related to geology and oil companies. They have developed their work in Occidental Petroleum¹⁰, Amoco¹¹, Total¹², Petroconsultants Geneva¹³, etc. Although many of them have published these studies while already retired from their activity in these companies, I doubt very much that these people do not appreciate the way of life that all that "cheap" energy has allowed them to lead, the technologies that it has made possible to develop and the societies that all this has shaped. Now, that these people apparently know what they are talking about, that they have no interest in putting that whole lifestyle in danger, even that it may seem that they are no longer mediated by the interests of said oil companies, etc. does not mean that they are not wrong or even lie.

The much-vaunted economic crisis that was uncovered in 2007 will undoubtedly have purely monetary, speculative causes or those derived from the necessary restructuring of a mass consumption society model supported by increasingly complex technologies, although there are people who blamed the basis of said crisis to much more tangible material issues (declining scarcity of the so-called natural resources -essential for the maintenance of the system- and the problems that this generates). It's hard to say how much of each will be. In 2008, the price of a barrel of oil skyrocketed, comfortably exceeding \$150 per barrel. This motivated those who defended the theory of the systematic nature of the crisis, that is, those who basically attributed it to the decline of "natural-energy resources" to become emboldened (well, to put it in an exaggerated way). After a few months, the price of a barrel of oil also fell significantly; here those

poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out*, page 237).

¹⁰ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

¹¹ For example: "In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined." (*Earth's Revenge*, page 166).

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

who defended the circumstantial nature of said crisis, that is, those who argued that it had nothing to do with the scarcity of basic natural resources such as oil, were equally emboldened, branding the former as doomsayers.

That was the thing, but let's see the situation from perspective. Once that moment of great ups and downs has passed, between 2009 and today (early 2014) the average price of a barrel of oil has been around \$100. Between 2000 and 2007, the average price of a barrel was around \$35 per barrel. It should also be noted that the year 2000 began with a strong increase in the price of a barrel compared to what it had in the mid and late 1990s, for example. Right now (2014) the average price of a barrel is 3 times more than in 2007, 7 years ago. Undoubtedly, the price of oil can be due to multiple circumstantial factors (political, strategic, speculative...), but a factor that is never circumstantial, but fixed in the incidence of said prices (at least in the medium term and in general) , is the TRE. If 1 is required to obtain 10 barrels of oil, that is one thing; if to get those same 10 you need 3, it is quite another. In this aspect, the monetary value of the barrels is secondary, although I suppose that this factor will also have a strong impact on said monetary value.

In the last 10-12 years from the spectrum of the network of oil and gas companies, either directly or through the creation and strengthening of subsidiaries, they are promoting the exploitation and use of heavy oil (from bituminous sands, for example) or of difficult access and shale gas as a complement to the hitherto common oil and gas. These elements, also called non-conventional, have, due to their difficulty in the whole process of exploitation, extraction, filtering, liquefying, infrastructure, etc., a much lower TER than, for example, current conventional oil (as I remember, it has a much lower TER than that of 1970, much lower than that of 1950). Why spend resources on elements that are not competitive with respect to conventional oil and gas (even the current one), when they could be used to exploit those more competitive resources even more massively? Who knows, but it stands to reason that scarcity could be a very compelling reason.

If I am focusing in this article on the case of oil, it is because it has had, and still has, a very high use and energy yield, much higher than the rest of the energy sources, with the exception of perhaps hydroelectric energy (energy that at a globally, is exploited, at least conventionally, almost to the maximum, with very little margin for increasing energy production by this means -I insist, at a general level-), with the difference, moreover, that oil, apart from generating electrical energy, etc., is also used for transportation, something essential for industrial societies dependent on all kinds of resources brought and taken from other parts of the planet. Nuclear energy itself is considered efficient, but only when the operating performance of a nuclear power plant is taken into account, when it is already built and managed by a company for a few years. But, when the cost of building these plants, the accompanying infrastructure, the search for and exploitation of deposits of uranium and other materials, the dismantling of nuclear power plants, their call has ended, is included in the account (which is not done). useful life when its activity ceases, the management of the waste it generates

(something that can cover a very long term), in addition to meeting the expenses with the insurers in the event of a serious accident, (which, regardless of who manages the central, is necessarily assumed, at least in theory, by the State) the efficiency of energy use falls many integers. In fact, according to what is claimed, it ends up having a little more than mediocre TER, compared to that of oil, for example.

In addition, it should be noted that all the development and implementation of different energy sources, and all of them in a very partial and limited way (hydroelectric, photovoltaic, nuclear, coal, etc.) in the last hundred years, have been possible thanks to the massive use easy to extract oil, great performance and cheap. It can be said, therefore, that any conversion of the socio-technological system that we suffer to other energy sources, in a general way (in case this was hypothetically feasible at such a level) would entail a massive use of oil at such a level that it would require a strict strategic plan that Apparently, to this day it is neither being carried out nor is it in sight.

The development of the technological system has been the result of several factors (among them the so-called human ingenuity, for better or for worse), but an essential factor (and very material and tangible) in each of its stages has been the type of energy available at all times, both in quantity and in quality or energy performance. The steam engine was made possible mainly by the use of coal, just as a modern airplane would not fly without oil. Here I am not referring only to the type of technology, but to the degree of expansion and generalization that it has allowed, to the structural interactions that this process has generated in the degree of complexity of human societies and in the degree of exploitation and degradation of ecosystems at higher levels, resulting in the deterioration of the possibilities of autonomy of wildlife (including humans). Therefore, the energy factor will necessarily condition the future of the technological system, as it has done in the past and does in the present. Yes, I know that I am stating the obvious, but sometimes I perceive from many people that technology has more to do with black magic than with strictly material factors. However, in a material and limited world, everything has its limit, at least the material.

As an example, the article by Eileen Crist, entitled "The Limits to Growth and the Biodiversity Crisis" published on this same web page¹⁴ says, among many other things:

Realistically, it is possible for the Earth to be colonized by Homo sapiens without violating the basic conditions that allow the survival of the human species. Let's consider some possibilities. Natural forests could be replaced by reforestation — even genetically modified to absorb more carbon dioxide and reach maturity faster. Degraded crop fields could be re-cultivated if seeds designed to grow in them were used; a major assimilation of the rational methods of agroecology, such as composting, rotating and mixing crops, could breathe some life into depleted soils. Depleted fishing grounds and extinct fish

¹⁴ Indomitable Nature: [<http://www.naturalezaindomita.com/textos/los-limites-al-crecimiento-y-la-crisis-de-la-biodiversidad>][<http://www.naturalezaindomita.com/textos/los-limites-al-growth-and-the-crisis-of-biodiversity>]. N. from the editors.

could be replaced by the launch of large-scale aquaculture to provide protein for humans. Water scarcity problems could be managed through rationing, more efficient technologies, or huge engineering projects like seawater desalination.

In short, on the face of the Earth, the original services provided by wild Nature could be massively modified—and replaced—by engineering initiatives applied to Nature in order to sustain life artificially.

It is very risky to do futurology, but here (to serve only as an example) he ventures a possibility of the future that he claims to be realistic. Okay, but what does he support to say that? I don't know what the future will bring, but I would take these types of visions with a lot of tweezers; if they are not supported by solid material foundations, they can be just talking.

Let's see, I guess we all need to eat and drink. Aquaculture, for example, what inputs does aquaculture require, the management of these infrastructures, the feeding of farmed fish, the management of their organic waste, the need for antibiotics, among other factors to be taken into account, in order to keep alive to all that massive accumulation of fish, etc.? How much energy does that require?

Regarding water desalination, people drank water directly from rivers, lakes, streams, etc. Later, water began to be drawn from wells (which had to be dug). After this, water had to be pumped from these wells. Pipelines, drains, sewage works, sanitation, etc. began to become necessary in large towns. Then the purification of the water and its distribution became necessary. And finally, desalinate. Desalination of seawater to make it drinkable requires, apart from other things, enormous amounts of extra energy, added to what is already necessary for a couple of billion people to be able to drink drinking water today, an action that originally did not require more than a (greater or lesser) dose of animal energy (usually from the person who drank).

As of today (as I say, it is not my intention to make predictions), where it seems that the energy industry is putting candles to the saint (regardless of what already exists) is in the oil that they trust to be able to exploit in the arctic, which, it seems, is losing large masses of ice for what is called climate change. If that is the case, what they don't know is how much there will be (although many geologists already indicate that it probably won't be comparable, for example, to what the Middle East area has been). What is certain is that in the case of oil extraction in the open sea and, generally, with bad weather and seabed conditions, the ERR of said oil, if it is exploited, will not be even remotely comparable to the conventional oil. And, for the moment, it seems that this is what it is.

Well, I have only focused on the energy factor but, for purely material reasons, and although it may seem so due to its inertia, the techno-industrial system is not omnipotent, much less autonomous or self-sufficient. And I'm not saying this as a consolation, since its collapse is not *necessarily* in sight in the short term and, on the other hand, its disastrous consequences for the autonomy of the wild *are already evident* >.

PART II:

Within the spectrum of varied opinions in this regard, among other things, of oil as a base energy for the exploitation of other energy sources at the level required today in industrial societies, of the so-called "peak oil", of the energy return rate of any of these energy sources and its direct relationship with the possibilities of maintenance and development of the industrial technological system (ITS from here on), the consensus seems to be much greater in terms of the perception that the EROEI of oil (and, therefore, therefore, of the rest of the energy sources dependent on oil), has been declining continuously and sharply since, at least, the beginning of the 1970s. It is not that this trend was not declining at a general level before this date, regarding for example to the years 30-40, but it was not continuous at all times since, until the 1960s, large deposits were discovered and put into operation to replace or compose supplement those that were declining. The same has not happened in recent decades; It is not that new deposits have not been started up in that period of time, but that they have not been as many, neither in terms of recoverable reserves nor in EROI, compared to those that have been declining in that time. So, simplifying, it can be said that for more than 40 years the oil discovered and put into exploitation has not been able to cover the gap left by the oil used and consumed in that period of time, neither in quantity nor in quality (TRE). So far I am talking about oil that is usually defined as conventional (here, of course, there is also variety and differences). The attempts that have been made to replace or complement this energy source (even more so in its facet of fuel for transportation and to move powerful machines, as well as in the transformation of derived materials, such as plastics and a long etc.) have been, to broad strokes and in order of importance:

- Shale oil, extracted using extraction techniques by hydraulic rock fracturing (*fracking*): this technique is well known today and whoever wants to can get more detailed information from multiple sources.¹⁵ Comment, yes, that, due to its extraction and transformation characteristics, as well as the infrastructures necessary for all this, it has a very low EROEI compared to conventional oil.

- Ultra-heavy oil, such as that extracted from the so-called bituminous sands, etc.: this in turn has its own characteristics and exploitation and transformation conditions, which mean that it has a very low EROI compared to conventional oil.

¹⁵ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

- Agrofuels, based on various raw materials (corn, palm, soybean, etc.): each with different characteristics but equally, making an average, with a very low EROI compared to conventional oil.

It is often said that new technologies have made it possible to use these "new" resources that could not be exploited before. Just comment, for example, that the technique of *fracking* has been possible since at least the middle of the last century. Since then, this technique (which has been used on a small scale in a more or less experimental way until the beginning of the 21st century) has certainly been refined, becoming more effective. However, the truth is that in the second half of the 20th century, these "new resources" were not used. Not because (broadly speaking) it wasn't possible, but rather because they weren't worth it (having large quantities of oil that are much easier to extract and transform and with a vastly higher TER).

So, apparently, it can be said in a way adjusted to reality that we have been in continuous energy decline for more than 40 years (whether it is perceived in a striking way or not); that there do not seem to be any great prospects on the horizon today to reverse this trend (for example, in the first part of this article, the possibilities that the melting of the Arctic could bring in this regard were discussed, but with great uncertainties, doubts and problems); and that, on the other hand, the ITS needs, due to its growing complexity until now, more energy with each passing day, not only for new developments, but simply to sustain the infrastructures that make its static maintenance possible. It should be said that, today, for example, the world's average daily consumption is about 95 million barrels of oil and, to a large extent, it is being covered by the remainder of the main deposits discovered or put into operation before the end of from the 1960s especially, with the complement, to a lesser extent, of what was put into operation after that date.

In the first part of this article I made reference to a conference I attended given by *Pedro Prieto*, co-responsible for the website *crisisenergetica.org*. In it, the speaker gave the fact that, in order to maintain a type of society as technically and organizationally complex as the one we have here, an energy (or group of energies) with a minimum EIRR of 10:1 was needed, and more energy yet for such a society to grow in technological complexity. I do not know with what calculations he will have reached that conclusion and if it will be accurate. But this reminds us that, to maintain all this framework, not just anything is worth it.

So it does not seem unreasonable to assume that, if this long phase of energy decline continues, a point will be reached where said maintenance is compromised. It can also be assumed that great efforts will be made for this maintenance, perhaps in some way different from what we know. The inertia of industrial society is enormous enough not to imagine that, at least, they will be tried. If a limit point of energy scarcity is reached, it can be assumed that an attempt to adapt the ITS to that situation would be a technological reduction in quantity (less extension of various technologies) or in quality (less complex) or both, in order, as far as possible, to try to somehow maintain a certain level of the technological system.

Technological development as a process has gone further, both in generalization and in complexity, in a more resounding way since the industrial revolution and with an almost exponential growth in recent decades. How would the ITS fit in a long-term phase of stagnation and setback? in the time? For example, could a process of increasing complexity (more complex technologies) be maintained in a situation of massively decreasing generalization (much less generalized technologies)? Multiple technologies have been developed, with great effort, on a small scale first, to later become generalized (for example, some very complex technologies, nowadays everyday in industrial societies, derive from technologies of military origin with initially much more restricted use). But, to a certain extent, this generalization has probably paved the way for new technological advances, lowering all kinds of costs (energy among others) that have allowed these "savings" to be invested in new developments. In times of abundance there are people who dedicate themselves to great expenses, but in times of scarcity you have to "count the lentils you put in the pot".

In another sense, could less complex technologies be generalized? Any process of generalization of a series of simpler technologies (but still complex to a certain degree¹⁶) to an important part of the human societies of this planet would require, today, a contradictorily very complex and extensive infrastructure (transport, mining exploitation, production processes). Let us bear in mind that we start from a situation: industrial societies have tended towards globalization, homogenization and interdependence. Not all societies, at the local level, have the material resources, production capacity, research, etc. enough to maintain some mode of technological development of a certain complexity in an autarkic way.

If this turning point is reached, it is certain that larger layers of the population will have to "eat" all the problems that technological development objectively entails (and has entailed) without being able to take advantage of its "benefits". The promise of the technophile ideology that these problems can be solved, in turn, with new technological developments would no longer be, in general, a feasible option (in this context, the number of problems grows inversely proportional to the number of resources with which to deal with them).

From today's perspective, in an advanced industrial society, it seems difficult to imagine that technological development could come to be considered the problem, in a general way; it would be easier to imagine that, given the circumstances, it would at least not be considered as the solution. Ideologies succeed when, in addition to offering desirable promises, they can be used in practice effectively and to advantage in a perceptible way. The technophile ideology at that point would begin to fail to meet these premises. However, an ideology contrary to technological development and that takes Wild Nature as a reference could have more opportunities to break through,

¹⁶ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

both on a practical level (it would become better adapted to the surrounding reality) and on a more abstract level (it would offer certain positive values in the midst of a situation of very dramatic confusion for broad layers of the population —the defense as ideals of the intrinsic value of Nature, autonomy, hunter-gatherer ways of life, etc.-). It is difficult to forecast the future, but it is very probable that the STI will have to face big problems (certainly not only the energy factor) to last at least as it is known today, in a period of time not as long as is usually the case. suppose.

Grades:

1. Quote taken from a conference by Pedro Prieto (co-responsible for the website [<http://www.crisisenergetica.org>][www.crisisenergetica.org]) held in Bilbao in May 2011, if I remember correctly.

2. *Environmental accounting, energy and decision making*, Howard T. Odum. Publisher John Wiley & Sons, 1995.

3. *Energy and the US economy: a biophysical perspective*, Cutler J. Cleveland, Robert Costanza, Charles AS Hall, and Robert Kaufmann. Originally published in *Science*, New Series, Vol. 225, no. 4665, pp. 890897, 1984.

4. The averages resulting from the TER calculation, perhaps due to their complexity, can be a somewhat confusing dance of figures. One clear thing on which the sources generally agree is the strong downward trend in the ERR of oil, more evident especially since the 1970s.

5. Shell Oil Company, US-based oil company founded in 1912, subsidiary of Royal Dutch Shell. It is one of the most important energy multinationals worldwide.

6. Colin J. Campbell, 1931- , Germany, geologist, worked as a manager and consultant for different institutions and companies in the oil sector. He founded the Association for the Study of Peak Oil and Gas (ASPO), a network of scientists and institutions with an interest in determining the timing and impact of the peak and slump in global oil production. oil and gas.

7. Kenneth S. Deffeyes, 1931- , USA, geologist and professor emeritus, worked with M. King Hubbert at the Shell Oil Company.

8. LF Ivanhoe, 1920-2003, geologist, worked for Occidental Petroleum Company, founder of the M. King Hubbert Center for Petroleum Supply Studies.

9. Walter Lewellyn Youngquist, 1921- , USA, retired geologist, taught at the University of Oregon. He is the author of the book *GeoDestinies: The inevitable control of Earth resources over nations and individuals*.

10. Occidental Petroleum, a US-based company founded in 1920. Dedicated to the exploration and extraction of oil and gas.

11. Amoco Corporation, formerly Standard Oil Company of Indiana, an American oil and petrochemical company founded in 1889 to operate a refinery located in Whiting, Indiana. On March 16, 1978, the tanker Amoco Cádiz capsized off the coast of

Brittany in France, causing one of the largest oil spills in history. Amoco was fully acquired by BP (British Petroleum) in 2000.

12. Currently Total SA, a company founded in 1924 based in France, dedicated to the oil and gas sector worldwide.

13. Petroconsultants, a company founded in 1968 in Geneva (Switzerland), dedicated to collecting information and creating cartography on the exploration and extraction of oil and gas. It was acquired by IHS in 1996.

14. See, for example, the "References" section of the entry "Hydraulic fracturing" on Wikipedia: [https://es.wikipedia.org/wiki/Fracturaci%C3%B3n_hidr%C3%A1ulica][https://en.wikipedia.org/wiki/Fracturaci%C3%B3n_hidr%C3%A1ulica.]

15. By this I mean technologies such as steel hand tools (hoes, hammers, etc.), which are simple enough to efficiently perform subsistence work with human muscle power alone, but are complex enough that it is not possible to manufacture and obtain them everywhere without the intervention of the STI.

KEEP THE OBJECTIVE[i]

By Theodore John Kaczynski

The following is an excerpt, largely rewritten, from a letter to the editor-in-chief of the *John Jay Sentinel*, a student newspaper at the John Jay College of Criminal Justice. In its original form, the letter was published in the March and April 2011 issues of the *Sentinel*. The writer had correctly pointed out that, under capitalism, economic competition encourages technological development, and I was wondering if it would therefore be worth the time and effort to eliminate capitalism. Here is my answer:

Those of us who believe that the technological system is an evil are often tempted to attack some of the subordinate evils that are associated with it, such as capitalism, globalization, centralization, bureaucracy, interference, and the sheer size of government. governments, environmental recklessness and vast economic inequalities. We should resist this temptation. Of course, evils like the ones I have listed can be used as tools to attack the technological system, pointing out that such evils are inevitably part of said system. But it is not advisable to attack any of the subordinate evils without at the same time attacking the technological system as a whole.

What makes subservient evils tempting targets for attack is that there are already considerable numbers of people who strongly reject them and who could be rallied to resist them. Furthermore, if any of these evils could be eliminated, the growth of the technological system would be retarded and its negative consequences mitigated to a certain extent. Capitalism, for example, is currently the most conducive economic system for technological development, so if we could get rid of capitalism we would slow down technological progress to some extent and, furthermore, we would reduce economic inequalities. Globalization contributes to economic and technological efficiency, as there are obvious advantages to systems in which natural, human, and technical resources can be freely transferred from any part of the world to any other part where they may be needed. So if we could end globalization and economically isolate each region of the world from all the others, technological progress would slow down significantly. Centralization is also important for technological progress. For example, in order to keep the US economically functioning properly, there has to be some central authority regulating banking, money printing, etc., otherwise the US could experience the same difficulties. than Germany before its unification, when much of the country

was still divided into numerous small, independent states, each with its own banking regulations, its own currency, its own weights and measures, etc.¹

*Because there were so many small states, ... there were many different civil and penal codes, many different types of coins and bills, many different types of military, financial, and transportation-related institutions. . The citizen of Württemberg needed a passport to travel to Baden. For his stay in Koburg-Gotha, Braunschweig, or Schwarzburg-Rudolfstadt, the citizen of Baden needed to exchange currency.*²[1836]

For economic development to be normal, financial and commercial regulation in Germany had to undergo a process of centralization that lasted for most of the 19th century.[1837][1838] If centralization is could reverse in some way in Germany (or in the US, or in any other country), economic growth and technological progress could be seriously slowed down.

So why not attack centralization? First, it would be extremely difficult to attack centralization successfully. An organization or a movement would have to focus all its energy on that attack, and even if they succeeded in substantially reducing centralization, the result would only be some delay in technological progress; neither the technological system nor the main evils associated with it would be eliminated. Therefore, in the attack on centralization, the movement would use its resources inefficiently: it would mean spending a lot of energy hoping to obtain only a modest gain.

Worse still, by concentrating its energy on the campaign against centralization, the movement would have diverted attention (its own and that of others) from the more important objective: the technological system itself.

In any case, the attack on centralization could not succeed. Of course, there is no special difficulty in decentralizing in situations where centralization has proven to be economically inefficient. For example, excessive centralized control over economic activity, also known as socialism, has largely disappeared due to its inefficiency. But where centralization promotes efficiency, its prevalence is guaranteed by a process of natural selection.³ Systems that are more centralized (in areas where centralization contributes to efficiency) do better than less centralized systems. Hence the former tend to expand at the expense of the latter. Since inefficiency imposes economic and other hardships on people, it causes most of them to oppose decentralization. Even most of those who now have a negative view of centralization would oppose decentralization when they learned what it would cost them in terms of efficiency. For example, if it were

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Translation of —Stay on Target”, by Anonymous with Caution. Original version published in *Anti-Tech*

³ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

desired that, [in the United States], each state in the Union establish its own monetary policy and print its own currency, independently of all the other states, the proposal would be dismissed and regarded as ridiculous. Even if such a measure were somehow to be put into effect, the negative consequences—such as monetary chaos, etc.—would anger so many people that centralized control in the monetary realm would soon be restored.

Needless to say, if future events ever cause economically and technologically centralized systems to be *inefficient* compared to less centralized ones, they might be relatively easy to decentralize. But in such a case, the attack on centralization would mean *promoting* technological progress instead of retarding it. In both cases, attacking centralization is not an effective way to resist the advance of technological progress.

Arguments very similar to the previous ones serve to reject any attempt to eliminate capitalism. To have any hope of eliminating capitalism, a movement would have to concentrate all its energy on that task, and even if it succeeded in eliminating capitalism, the result would still be very modest, because technological progress would continue, albeit at a slightly slower pace. There was no capitalism in the Soviet Union, for example, but that country was by no means a technologically insignificant power. Even before World War II, the Soviets were among the leaders in nuclear physics;⁴ their fighter jets, the MiG 15s, surprised Western forces in the Korean War with their speed and agility;⁵ the Soviets were the first to develop a truly successful jet aircraft, the Tu-104;^[7,ii] and the Soviet Union was the first country to put an artificial satellite into orbit.⁶

Therefore, if an anti-technology movement were to focus on the elimination of capitalism, it would expend an enormous amount of energy to get very little in return. What's worse, by focusing on capitalism, the movement would be diverting its attention and that of others from the most important goal: the elimination of the technological system itself.

An attack on capitalism would also be useless, or would only be successful temporarily and in a few countries at most. Capitalism has become the world's dominant economic system through a process of natural selection; it has replaced other systems, since under current conditions capitalism has proven to be economically and technologically more efficient. For this reason, even if we could get rid of capitalism in some countries, they would still have a very strong inclination to return to capitalist eco-

⁴ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁵ A couple of examples:

⁶ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

conomic structures as the relative⁷ ineffectiveness of their non-capitalist system became apparent. This has been proven by experience: when the socialist countries of Eastern Europe could not keep up with the West economically or technologically, they adopted capitalist systems. Sweden was once ideologically socialist although, in practical terms, socialism never got very far in that country. Today Sweden is still a capitalist welfare state: and less and less of a welfare state, as it reduces profits for the sake of economic efficiency.⁸ China remains formally socialist but, for the sake of economic success, the Chinese government now largely allows private enterprise, that is, capitalism.⁹ In Nicaragua, the Sandinistas appear to remain socialists, but in reality they are returning to capitalism.¹⁰ I only know of two countries in the world that remain without capitalism: Cuba and North Korea. Nobody wants to imitate Cuba or North Korea, because they have failed economically. And that is why Cuba is now (2011) taking some timid steps in the direction of capitalism.¹¹

So it is clear that as long as we live in a technological world, we will never get rid of capitalism unless and until it is replaced by some more economically and technologically efficient system.

The arguments that I have presented here, regarding centralization and capitalism, are equally applicable to globalization, to bureaucracy, to the interference and large size of governments, to environmental recklessness and to any type of evil whose elimination

⁷ Commercial aircraft powered by jet engines. *N. of the trad.*

⁸ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out*, page 237).

⁹ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹⁰ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

¹¹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

would merely hinder the efficiency of the technological system but still allow its growth. As long as society remains saturated with the values of the technological system, most people will not accept any measure that seriously hinders the functioning of that system. In order to get people to accept such measures, they would first have to be convinced that the supposed "benefits" of modern technology are not worth the price that must be paid for them. Therefore, the ideological attack must be focused on modern technology itself. Any attempt to eliminate capitalism, globalization, centralization, or any other subservient evil would only divert attention from the need to eliminate the entire technological system.

Grades:

1. Dorpalen, page 167. Zimmermann, pages 8-9. *The New Encyclopaedia Britannica* (NEB), (2003), Volume 20, —Germany", pages 106, 111 and 113. By —unification", I mean not only the founding of the German Empire in 1871, but to a process that could be said to last up to 93 years, from the changes imposed by the French conquerors in 1807 (*ibid.*, page 102), until the promulgation of a uniform civil code for the Empire in 1900 (Zimmermann, page 9).

2. Zimmermann, page 8, quotes a certain "Löwenthal" without giving any further indication of the source.

3. See note 1 above and Tipton (full article). Tipton argues that historians are wrong when they identify a certain date, for example, 1834 (creation of the Customs Union¹²) or 1871 (foundation of the German Empire), as the point at which German economic development — started to take off": the quantitative data shows that German economic development throughout the period in question was a smooth and continuous process, in which, the "take off" points are not clear.

However, in some places (for example, pages 222-23), Tipton seems to argue that centralizing events, such as the creation of the Customs Union of the States of Germany or the founding of the Empire, were not important for the economic development of Germany. Germany. If this is what he means, then his arguments must rest on the assumption that such events could not have been of economic importance unless they were accompanied by an immediate change in the rate of economic growth. And that assumption is clearly unwarranted. Among other things, as Tipton himself points out, the changes in economic regulation brought about by the Customs Union and the Empire took several decades to take place: the Customs Union was not fully implemented until 1857 (Tipton, pages 201 and 209). , while the economically relevant legislation of the Empire was enacted progressively in parts and was not finalized until 1897, or even

¹² —Zollverein" in the original. Term of German origin, its translation into Spanish is —Customs Union of the States of Germany". The —Zollverein", as its translation indicates, was a customs organization created in 1834 around Prussia with the aim of suppressing economic borders and helping to unify trade and currency throughout Germany. *N. of the trad.*

perhaps 1900 (Zimmermann, page 9; Tipton, page 209). Furthermore, executing the economic consequences of the regulatory changes required certain advances, such as the construction of railways (Tipton, pages 200-201 and 205), which could not happen overnight.

Thus, the absence of quantitatively identifiable "take-off" points provides no evidence that centralization of economic regulation was unimportant for economic growth. Tipton himself points out that —[the] free movement of resources is important for development" (page 200), and that —[the] factors of production will have greater mobility [..] in an area without internal tariffs, decentralized monetary systems, or variations in trade regulations" (page 200), so it can be inferred that centralized economic regulation is important for economic development.

4. See Chapter Two of this same book.[iv]

5. *NEB* (2003), Vol. 21, —International Relations", page 858.

6. *Ibid.*, Vol. 8, —MiG," page 117. See also, *Air & Space*, Oct./Nov. 2013, page 80.

7. Woodall, page 4. Mellow, pages 61 and 65.

8. *NEB* (2003), Vol. 19, "Exploration," pages 47-48.

9. *The Economist*, June 11, 2011, page 58.

10. The private sector constitutes the strongest part of the Chinese economy. *The Economist*, March 12, 2011, pages 79-80, and June 25, 2011, page 14, Special Report (—the dynamism in China's economy is mainly generated by non-state enterprises"). It is true that massive government intervention has played an important role in building the Chinese economy, but this has been only a temporary stage that is characteristic of backward countries striving to catch up with fully developed industrial nations. See, *NEB* (2003), Volume 24, —Modernization and Industrialization," page 288. In all likelihood, government intervention in the Chinese economy will be less and less favorable to economic vigor as the country moves beyond the goal of "catching up."

11. *The Economist*, August 27, 2011, page 33; November 5, 2011, pages 47-48.

12. *The Week*, April 29, 2011, page 8. *USA Today*, May 10, 2011, page 6A.

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The chapter in question is “Why the Technological System Will Destroy Itself”. *N. of the trad.*

Economist, The

NEB = *The New Encyclopaedia Britannica*, Fifteenth Edition. The Fifteenth Edition has been modified every few years. In this text, a year is added in parentheses to indicate the cited version of the *NEB*.

USA Today

Week, The

[28][] “n_o h_a and a separate place...”. *N. from trans.*

[34][] “I wish to speak a Word for Nature, for absolute freedom and wildness” in the original. *N. from t.*

[k] “Nature With Integrity” in the original. *N. from t.*

[36][][p] “Winterfat” in the original. *Krascheninnikovia lanata*. In winter it is an important source of forage for cattle in North America, probably why ranchers know and appreciate it. *N. from t.*

[q] Genus *Sceloporus*. *N. from t.*

[r] Lizards of the species *Heloderma suspectum*. *N. from t.*

[t] Refers to Daniel Boone (1734-1820), famous American explorer and pioneer. *N. from t.*

[u] “Wilderness Areas” in the original. *N. from t.*

[v] *Idem. N. of the t.*

[38][] American biologist. He is one of the founders of The Wildlands Project (currently known as The Wildlands Network), a conservation organization that advocates for the protection of large wilderness areas linked by biological corridors on a continental scale. *N. from t.*

and National Association for the Advancement of Colored People. *N. from t.*

z

Bioregionalism is a movement that emerged in the early seventies of the 20th century in the United States. This movement defends that communities and human groups can face the catastrophic consequences of human activities on terrestrial ecosystems trying to live in harmony with the bioregion in which they live. *N. from trans.*

[aa] “Mixed communities” in the original. *N. from t.*

[bb] “Wildness” in the original. *N. from t.*

[cc] “Pasqueflower” in the original. The common English name refers to plants of the genus *Pulsatilla*, which flower very early in spring. *N. from t.*

dd “Lord Man” in the original. *N. from t.*

[ee] “Hubris” in the original. Term from the Greek (ἡβρις, *hybris*) that refers to excessive pride, to arrogance. *N. from t.*

[40][][ff] *Ozymandias* is the title of a poem by the romantic writer Percy Bysshe Shelley. The central theme of *Ozymandias* is the inevitable decline of all leaders and the empires they build no matter how powerful they are in their time. *N. from t.*

[gg] “Wildness” in the original. It refers to the character or quality of being wild. In this case, it has been chosen to translate it as “the wild”. *N. from t.*

[hh] *Idem. N. from t.*

[42] “Landscape-scale studies” in the original. See footnote f. *N. from t.*

[44] ^Translation by Último Reducto of “Earth is not a Garden”. Original published in *AEON*, September 18, 2014. [<https://aeon.co/essays/giving-up-on-wilderness-means-a-barren-future-for-the-earth>][<https://aeon.co/essays/giving-up-on-wilderness-means-a-barren-future-for-the-earth>] *N. of t.*

[61] “Wilderness” in the original. *N. of t.*

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocentrica/por-qu-el-paisaje-productivo-no-funciona>][<http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/why-the-productive-landscape-doesn't-work>]. *N. from t.*

[ii] Edward Teller, American nuclear physicist of Hungarian origin. FC, a group that authored *Industrial Society and Its Future* of which Kaczynski was allegedly the only member, mentioned Dr. Teller, in paragraph 88 of said work, as an example of a scientist whose motivations for research did not they had nothing to do with the good of humanity. *N. T.*

[167] “Climate Project” in the original. *N. from t.*

[168] In the US political scene, and saving the distance, “democrat” comes to mean something similar to “social democrat” in Europe. *N. from t.*

[169] “Jersey Shore” is the title of a “reality show” type program broadcast on MTV. *N. from t.*

[170] “They (I say “they” as if solar panels were somehow more alive and sentient than the very real and very living beings whose homes are destroyed to make room for them) will require...” in the original. It is difficult to translate the phrase in parentheses and to understand it with the meaning that the author intended, perhaps not very fortunately, to give it in English: that, if you are not careful, you can end up thinking of “green” technologies as something so natural and ecological as the very habitats and species destroyed by them, since environmentalism too often tends to consider them “good” and “clean” parts of the “environment”. So it has been decided to remove the parentheses in the translation and add this note. *T.N.*

[f] The author is American. *N. of t.*

[171] *Danaus plexippus*. [<https://es.wikipedia.org/wiki/Lepid%3%b3ptero>][Lepidoptera]natural migratory of [https://es.wikipedia.org/wiki/Am%3%a9rica_del_Norte][North America,] although it also resides in the [https://es.wikipedia.org/wiki/Islas_Canarias][Canary Islands,] the [<https://es.wikipedia.org/wiki/Azores>][Azores] and [<https://es.wikipedia.org/wiki/Madeira>][Madeira,] and appears occasionally as a transatlantic migrant in [https://es.wikipedia.org/wiki/Europa_Occidental][Western Europe.] *N. from t.*

h Name of a video game. *N. from t.*

[183] Title of the original version: *The Better Angels of Our Nature: Why Violence Has Declined*. The translator has used the 2012 edition of Espasa Libros for the citation.

- Environmental deterioration.
 - Climate change.
 - Potential hostile neighbors.
 - Potential friendly business partners.
 - The response given to the set of previous environmental problems.
 - [193][] “Trade off” in the original. *N. from t.*
 - [195][] “Trade off” in the original. *N. from t.*
 - [m] *Idem. N. from t.*
 - [197][][n] “...That Raises Short-Term Production Cost” in the original. *N. from t.*
 - [or] “Corms” in the original. *N. from t.*
 - [p] “Broodcomb” in the original. It refers to the part of the honeycomb where the larvae are deposited. *N. from t.*
 - [q] “Nesting site” in the original. *N. from t.*
 - [r] *Oreamnus americanus*, also called white goat. *N. from t.*
 - [199][] “Source-sink” in original. In the Anglo-Saxon world and within the field of ecology, “*source-sink models*” are used to assess habitat quality. “Source” would be an area of high-quality habitat that allows a given species to thrive. “Sink” would be an area of low quality habitat, where specimens of a species can be found, but which do not have the necessary characteristics for them to procreate and prosper. *N. from t.*
 - [u] “Key-stone predator” in the original. It refers to a predator whose presence is essential to keep the structure and composition of the ecosystem stable. *N. from t.*
 - [v] “Grasses” in the original. *N. from t.*
 - [200][] “Olafson” in the original. It’s a typo, the real name is Olofson. *N. from t.*
 - [and] *Idem N. of t.*
 - [xl] There is a Spanish edition: *The future of life*, Galaxia Gutenberg, 2003. *N. from t.*
 - [xli] There is a Spanish translation: “La extinction de lasspecies”, *Investigación y Ciencia*, January 2002. *N. from t.*
 - [xlii] There is an edition in Spanish: A long controversy: Darwin and Darwinism, *Crítica*, 2001. *N. from t.*
 - [270][]humans of the system. This reason underlies the more specific reasons discussed above. In each historical moment, social systems positively select (promote and facilitate) those values, ideologies and behaviors that favor them and negatively select (ignore and even persecute and censor) those that hinder their maintenance and development.
 - [c] Translation by Último Reducto of “Current Demographics Suggest Future Energy Supplies Will Be Inadequate to Slow Human Population Growth”, *PLoS One*. 2010; 5(10): e13206. Published *online* on October 5, 2010. doi: 10.1371/journal.pone.0013206. *N. from t.*
- In his approach to Reality, Naess differentiates between “structures” and “contents”. The structures would be the models and abstractions that are created to help us

understand and describe parts of Reality, while the contents would be the spontaneous and individual experiences that each person has of Reality. *N. from trans.*

[xl] “Self-willed, self-determined, and self-ordered” in the original. *N. of the trad.*

[xli] “Wilderness act’ wilderness” in the original. *N. of the trad.*

[xlii] “Wildness” in the original. *N. of the trad.*

[321][] Niobrara, in northern present-day Nebraska. *N. of the trad.*

N. of the trad.

[343][] Bighorn sheep, *Ovis canadensis*. Rocky mountain goat, “Rocky Mountain goat” in the original, *Oreamnos americanus*. Wapiti, “elk” in the original, *Cervus canadensis*. African buffalo, “African buffalo” in the original, *Syncerus caffer*. *N. from t.*

[344][] “Oak trees” in the original. Genus *Quercus*. *N. from t.*

[346][] “Asia” in the original. It has been modified in the translation because it seems to be an error, since the movement in Asia was faster in the east-west axis, except in the Indian subcontinent, while in Africa it was precisely from north to south (see Fig. 3) , as in America. *N. from t.*

[348][] *Eragrostis tef*. A type of cereal (Poaceae). *N. from t.*

[n] “Finger millet” in the original. *Eleusine coracana*. Other cereal. *N. de t.* or “Chat” in the original. *Catha edulis*. Celastraceae family plant. *N. from t.* p “Noog” in the original. *Guizotia abyssinica*. Plant of the Asteraceae family. *N. from t.*

[q] Plants of the genus *Ensete*, family Musaceae, with edible roots and similar to banana trees. *N. from t.*

[349][] *Taurotragus oryx*. A kind of antelope. *N. from t.*

[t] “Moose” in the original. *Moose Moose*. *N. from t.*

[u] “Bighorn sheep” in the original. *Ovibos moschatus*. *N. from t.*

[v] *Vulpes lagopus*. *N. from t.*

w *Chinchilla woolly* x *Chinchilla chinchilla*. *N. from t.*

x “Blueberries” in the original. *Vaccinium corybosum*. *N. of t.* and *Macadamia integrifolia* and *Macadamia tetraphylla*. *N. from t.* [z] “Pecans” in the original. *Carya illinoensis*. *N. from t.*

[351][][ee] There is an edition in Spanish: *Cabalos*, Altea, 1996. *N. from t.*

[ff] There is an edition in Spanish: *Plagas y pueblo*, Siglo XXI, 1984. *N. from t.*

[gg] There is a Spanish edition: *Transoceanic exchange: biological and cultural consequences from 1492*, National Autonomous University of Mexico, 1991. *N. from t.*

hh There is a Spanish edition: *Ecological imperialism: the biological expansion of Europe 9001900*, critique, 1988. *N. from t.*

[353][] In ecology, organic matter produced directly by organisms is called “primary production”.

[354][] autotrophs (photosynthetic and chemosynthetic). It is the base of trophic chains. *N. of the trad.*

[355][] An upwelling or upwelling zone is a zone where marine currents bring up nutrients from the zones

- [356] deep to the surface. *N. of the trad.*
- [357] A top predator is a predator species located at the top of the food chain in an ecosystem. *N. of the trad.*
- [358] Ppm = Parts per million, a measure of concentration commonly used in gases. *N. of the trad.*
- [359] *Corbicula fluminea*. *N. of the trad.*
- [361] The authors refer to the special report of the journal *Science*, entitled: “Human-dominated Ecosystems: Articles”, of which
- [362] This article is part of it. *N. from trans.*
- [363] “Wilderness” in the original. The English term “wilderness” refers to those areas in which humanization is very little or non-existent and in which natural dynamics and processes prevail. There is no single term in Spanish that serves to adequately name the concept to which the word “wilderness” refers, it can only be translated either by means of expressions made up of several words or only in an approximate way. Here it has been variously translated (“nature”, “wilderness”, “wild lands”, “wild world”, “wild ecosystems”, “the wild”, etc.) depending on the context. *N. from t.*
- [g] *Idem. N. from t.*
- [h] *Ditto. N. from t.*
- [j] Remember that this text dates from 1972, so in reality it would have been about 100 years. *N. from t.*
- [k] “The wild and the free” in the original. *N. from t.*
- [l] “Wilderness” in the original. *N. from t.*
- [m] “Human techniques” in the original. *N. from t.*
- [365][n] “Wild land” in the original. *N. from t.*
- [o] Drew, the author of this text, is Canadian and is writing for a Canadian magazine, *The Trumpeter*. *N. from t.*
- [p] “Wilderness” in the original. *N. from t.*
- [366] *Idem. N. from t.*
- [r] *Idem. N. from t.*
- [367] *Idem. N. from t.*
- [t] “Wilderness traveller” in the original. *N. of. u.*
- [u] “Wilderness” in the original. *N. from t.*
- [w] “Wilderness traveler” in the original. *N. from t.*
- [370] “Technical” in the original. See footnote e. *N. from t.*
- [z] *Idem. N. from t.*
- [aa] “Wilderness” in the original. *N. from t.*
- [bb] *Idem. N. from t.*
- [cc] *Idem. N. from t.*
- [dd] *Idem. N. from t.*
- [371][ee] *Idem. N. from t.*
- [ff] *Idem. N. from t.*
- [gg] *Idem. N. from t.*

[hh] *Idem. N. from t.*

[ii] *Idem. N. from t.*

[jj] “Wilderness park” in the original. “Wilderness park” is the name given by the Provincial Parks System of Ontario, Canada, to refer to certain protected “wild” natural areas. It would be the equivalent of the American “wilderness areas”. In fact, the expression “wilderness park” is also used today to designate some “wild” protected areas in the United States. *N. from t.*

[kk] “Wilderness” in the original. *N. from t.*

[mm] *Idem. N. from t*

[nn] *Idem. N. from t*

[oo] “Wilderness hotels” in the original. *N. from t.*

[pp] “Wilderness railroads and airports” in the original. *N. from t.*

[qq] “Wilderness highways” in the original. *N. from t.*

[373][] “Wilderness theaters and shopping plazas” in the original. *N. from t.*

[ss] “Wilderness” in the original. *N. from t.*

[tt] *Idem. N. from t.*

[uu] *Ditto. N. from t.*

[vv] *Idem. N. from t.*

[ww] *Ditto. N. from t.*

[yy] *Ditto. N. from t.*

[zz] *Idem. N. from t.*

[aaa] *Idem. N. from t.*

bbb There is an edition in Spanish: *The age of the technique*, Octaedro, 2003. *N. from t.*

[376][] Editions, 2002). The original article appeared in *Wild Earth* magazine 6, no. 4 (Winter 1996/1997): 62-66. © 1996 Ken Wu. *N. from t.*

[397][] Translation and adaptation by Último Reducto of a fragment taken from Chapter 15 of the book *Eco-Warriors: Understanding the Radical Environmental Movement*, by Rik Scarce (Noble Press, 1990). © 1990, Rick Scarce. *N. from t.*

[b] There is an edition in Spanish: *Hayduke lives!*, Berenice, 2014. *N. from t.*

[c] There is an edition in Spanish: *La banda de la tenaza*, Books4p, 2013. *N. from t.*

[d] Literally, “Smith, the Rarely Seen.” *N. from t*

[e] “Jack Mormon” in the original. Refers to an individual who is sympathetic to the Church of Jesus Christ of Latter-day Saints, but who is either not baptized in it, or is not a strict practitioner of its religion, or is part of some dissenting branch of the same . *N. from t.*

[f] Refers to *Ecodefense: A Field Guide to Monkeywrenching* (Ned Ludd Books, 1985), book by Dave Foreman. A manual of ecosabotage and other forms of direct action focused on the defense of Nature. *N. from t.*

[398][] “Smokey the Bear” [literally the Smoking or Smoked bear] is a caricature that represents a bear dressed as a forest firefighter used by the US Forest Service in its campaigns against fires forestry. *N. from t.*

[h] “Wilderness” in the original. Term that refers to ecosystems that are little or not at all humanized. Depending on the context, it can be translated as “wild areas”, “wild lands” or “wild ecosystems” or, more generally, as “Wild Nature”. *N. from t.*

[j] “Tree spike” in the original. It refers to a form of eco-sabotage consisting of inserting long nails made of steel or other hard materials into living trees in wild areas that are to be protected from logging and giving public notice to prevent them from being cut (nails damage harvesting machinery). sawmills). *N. from t.*

[k] There is an edition in Spanish: *The lonely of the desert*, Captain Swing, 2016. *N. from t.*

[401]] Translation by Último Reducto of chapter 8 (“Wildness and the Defense of Nature”) of the book *The Abstract Wild* (University of Arizona Press, 1996). *N. from t.*

[c] “Wildness” in the original. “Wildness” refers to the wild character of something and, in this sense, can also be translated as “the wild” (the wild part or aspect of something). In the present text it has been translated as “the wild character”, except in cases where it is explicitly indicated otherwise. *N. from t.*

[d] “The Wild”, in the sense of “wild things”, “wild Nature”. *N. from t.*

[e] “Wildness” in the original. *N. from t.*

[f] “Wildness” in the original. *N. from t.*

[g] “Self-willed” in the original. Although in principle it would mean something like “self-willed”, the term “self-willed” is often quite used, more or less metaphorically, by English-speaking radical conservationists to refer to those ecosystems and non-artificial beings (with consciousness and will or without them) that show their own dynamics and follow their own tendencies, that is, they are autonomous; or, put another way, wild. In this text, unless explicitly stated otherwise, it has been loosely translated as “self-regulated”. *N. from t.*

[h] Amerindian people of the Sonoran desert. *N. from t.*

[i] “The wild” in the original. *N. from t.*

[402]] “Wilderness” in the original. “Wilderness” refers to ecosystems or areas with little or no humanization, although sometimes, depending on the context, it can be translated as “wild nature”. In this text it has been translated as “wild ecosystems”, “wild lands”, “wild areas” or “wilderness areas”, except where explicitly indicated otherwise. *N. from t.*

[k] “Wildness” in the original. *N. from t.*

[m] “Wilderness” in the original. Here and in some other parts of the text, the author refers to the so-called “designated wilderness areas”, wild areas declared as protected based on the Wilderness Act in the United States. *N. from t.*

[n] *Idem.* *N. from t.*

[404]] This conservation organization is now called the Wildlans Network. *N. from t.*

[t] American conservation magazine that was published quarterly between 1991 and 2004. This text was written within that period and will refer to this magazine again later. *N. from t.*

[u] The author refers to Dave Foreman, Reed F. Noss, and the rest of the conservationists who created the Wildland Network. *N. from t.*

[406][] “Wish” or “want” in English. *N. from t.*

[407][] “With their own free will” in English. See footnote f. *N. from t.*

[408][][and] “Wilderness ethic” in the original. *N. from t.*

[409][] This refers to the fact that one of the definitions of “wilderness area” included in the Wilderness Act says that such areas are those in which human beings remain only as visitors. *N. from t.*

[mm] *Idem.* *N. from t.*

[nn] “Wilderness” in the original. *N. from t.*

[oo] “Wild” in the original. Despite literally meaning “wild”, in this case it has been loosely translated as “natural” to avoid redundancy and maintain the meaning of the phrase in this context. *N. from t.*

[pp] *Idem.* *N. of the t.*

[qq] “Wildness” in the original. *N. from t.*

[411][] “Iteration” in the original. Since this term (meaning “repetition”) is inconsistent with this context, it has been considered a typographical error and that the author actually meant “interaction”, a term much more consistent with the context. *N. from t.*

[tt] United States. *N. from t.*

[yy] “Wildness” in the original. *N. of t.*

[414][] “Wilderness and wild systems” in the original. *N. of T.*

[415][] *ccc* The author is probably referring to California condors, *Gymnogyps californianus*. At the time this text was written, the last specimens of the California condor were captured in the wild with the purpose of reproducing in captivity and then being reintroduced into Nature. The author is criticizing this measure. *N. from t.*

[416][] “Wilderness” in the original. *N. from t.*

[eee] Genus of plants belonging to the Brassicaceae family. *N. from t.*

[fff] “Biofuck” in the original. *N. from t.*

ggg “Do you want to improve the world? / I don’t think it can be done. / The world is sacred. / It can’t be improved. / If you tamper with it, you will ruin it. / If you treat it like an object, you’ll lose it. /... / The Master sees things as they are, / without trying to control them. / She lets go their own way, / and resides at the center of the circle.[”] in the original. *N. from t.*

[417][] hhh “Opossum shrimp” in the original. *Diluvial Mysis. N. of t.*

[jjj] “Lake trout” in the original. *Salvelinus namaycush. N. of t.*

kkk *Haliaeetus leucocephalus. N. of t.*

[mmm] “Wilderness Act-wilderness” in the original. *N. of t.*

[420][ppp] There is a Spanish translation: “Self-organized Criticality”, in *Research and Science*, n° 174, March 1991. *N. from t.*

[qqq] There is a Spanish translation: *Mirror and reflection: From chaos to order*. Editorial Gedisa, 1990. *N. from t.*

[rrr] There is a Spanish translation: *Discordant harmonies*. Accent Editions, 1993. *N. from t.*

[ttt] There is a Spanish translation: *Modernity and identity of the self*. Peninsula, 1997. *N. from t.*

[uuu] There is a Spanish translation: *Chaos: The creation of a new science*. Seix Barral, 1994. *N. from t.*

[422][vvv] There is a Spanish translation: *Reflections on Gender and Science*. Editorial Alfons el Magnanim, 1991. *N. from t.*

[www] There are multiple translations into Spanish, both on paper and online. For example: *Tao Te Ching*. Martínez Roca, 1999. Or *Tao Te Ching*, [http://www.swami-center.org/es/text/tao_te_ching.pdf][http://www.swami-center.org/en/text/tao_te_ching.pdf]. *N. from t.*

yyy There is a Spanish translation: [<http://www.naturalezaindomita.com/resenas/en-ausencia-de-lo-sagrado-el-fracaso-de-la-tecnologa-y-la-supervivencia-de-las-naciones-indias>][*In the absence of the sacred: The failure of technology and the*][<http://www.naturalezaindomita.com/resenas/en-ausencia-de-the-sacred-failure-of-technology-and-the-survival-of-indian-nations>][*survival-of-indian-nations*. Olañeta, 1996. *N. from t.*

[zzz] There is a Spanish version: *The tree of knowledge: The biological bases of human understanding*. Lumen Humanitas, 2013. *N. from t.*

[aaaa] There is a Spanish translation: *Fundamentals of Biological Conservation: Latin American Perspectives*. Economic Culture Fund of Spain, 2009. *N. of t.*

Increasing marginal returns occur if a one-unit increase in the variable factor of production results in a larger increase in the quantity of total product, holding all other factors of production fixed. *diminishing marginal returns* occur if a one-unit increase in the variable factor of production results in a smaller increase in the quantity of total output, keeping all other factors of production fixed *N. of the t.*

[452][u] *Diabrotica virgifera*. *N. from t.*

[463][in 2010 causing a great oil slick. See below the point dedicated to the prediction, control and

[464][accident repair. *N. from t.*

[468][The jatropha species used to produce biofuel is *Jatropha curcas*. *N. from t.*

[469][xv¹³ One foot is equal to 30.48 cm. *N. from t.*

[476][Important conservation organization in the United States. *N. from t.*

¹³ For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

f *Idem. N. of the t.*

g “Long-nosed bandicoot” in the original. *Perameles nasuta. N. of the t.*

h “Narrow-footed marsupial mouse” in the original. *Sminthopsis murina. N. from t.*

j *Drugs and food from little-known plants. N. of the t.*

[479][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/el-gran-punto-de-inflexin>][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-techno-industrial/the-great-inflection-point>][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-techno-industrial/the-great-inflection-point>].

[https://drive.google.com/file/d/1aZg7IGQeTKbfAd1nh9yUwLHn_G4iTCUV/view?usp=sharing][(https://drive.google.com/file/d/1aZg7IGQeTKbfAd1nh9yUwLHn_G4iTCUV/view?usp=sharin)[https://drive.google.com/file/d/1aZg7IGQeTKbfAd1nh9yUwLHn_G4iTCUV/view?usp=sharing][g)].

[490][and Lynas 2008). In particular, James Lovelock, one of the creators of the Gaia theory, is known for his enthusiastic defense of nuclear energy. However, the statement that nuclear energy does not contribute to the increase in greenhouse gases is true only if one only takes into account the processes that take place inside nuclear reactors; in any other case it is completely wrong. All the main phases of energy production from the construction of nuclear power plants to the mining and processing of uranium ore, through its transportation, the construction of reactors and electricity transmission lines, etc. they require huge amounts of fossil fuels. Waste, high costs, security concerns, the proliferation of nuclear weapons are just a few of the huge problems involved in the recently renewed enthusiasm around the nuclear industry. The end of the era of cheap energy excludes the possibility of resuming massive reactor construction in the style of what happened between the 1950s and the mid-1970s. Like other quasi-alternatives, nuclear energy is a derivative of fossil fuels .

[494][anonymous inside the IEA confirmed that the agency was systematically lying and inflating the data, probably under pressure from the US government. This is a vicious circle, since the IEA -and similar institutions- say the that governments want to hear and governments refer to 'professional' institutions for confirmation of their optimistic attitudes and forecasts - since governments always say what the public wants to hear. The point is that what these institutions say cannot be trusted.

[511][The English original can be found on Markus's website—[<http://www.isp.hr/~tmarkus/>][<http://www.isp.hr/~tmarkus/>] —under the title “Great turning point: Oil peak and disintegration of industrial civilization”. Translated by M. and UR *Translator's note*.

[m] Obviously this date is wrong. According to some graphs that appear searching in Google (for example: [<http://www.roperld.com/science/minerals/EROEIFossilFuels.htm%23oil>][<http://www.roperld.com/science/minerals/EROEIFossilFuels.htm#oil>]), it appears that in 1930 the EROI for oil was 1:100, falling to 1:30 in 1970, and to about 1:10 in 2000. *N. from t.*

[513][[]“OPEC” in the original. Organization of Petroleum Exporting Countries. *N. from t.*

[514][[] The Breakthrough Institute was founded in 2003 by Ted Nordhaus and Michael Schellenberger. It is an organization that promotes ecomodernism. *N. from t.*

[515][[] In the original it appears as figure XII. The following graph is listed as VII, and those that follow as VIII and VIIIa. The error has been corrected in the present translation. *N. from t.*

[t] “Re-location” in the original. It refers to refocusing on the local versus the global. *N. from t.*

[517][[] “Transition Towns movement” in the original. *N. from t.*

[518][[] “Localization” in the original. See footnote j in this same article. *N. from t.*

[and] “Doom-and-gloom or nihilistic doomesterism” in the original. Probably with “doomesterism” the author meant “doomerism”. *N. from t.*

[jj] There is a Spanish translation: *Exceeded: the ecological foundations for a revolutionary change*, Oceano, Mexico City, 2010. *N. from t.*

[kk] Web page currently inaccessible. *N. from t.*

[mm] There is a Spanish translation: *Green political thought*, Paidós, Barcelona, 1997.

[nn] web page currently inaccessible. *N. from t.*

[oo] There is a Spanish translation: *Hot, flat and crowded: why the world needs a green revolution*, Planeta, Barcelona, 2010. *N. from t.*

[pp] web page currently inaccessible (2020). *N. from t.*

[qq] *Idem.* *N. from t.*

[rr] There is a Spanish translation: *The party is over. War and economic collapse on the threshold of the end of the oil era*, Barrabés, Benasque, 2006. *N. from t.*

[522][[][ss] Web page currently inaccessible. *N. from t.*

[tt] There is a Spanish translation: *Blood and oil: dangers and consequences of dependence on crude oil*, Tendencias (Urano), Barcelona, 2006. *N. from t.*

[uu] Web page currently inaccessible. *N. from t.*

[vv] There is a Spanish translation: *The great emergency*, Barrabés, Benasque, 2007. *N. from t.*

[ww] Web page currently inaccessible. *N. from t.*

[524][[]two previous currents, which are often even incompatible), in this text it will be translated in one way or another depending on the context and according to what the author seems to be referring to in each case.

[e] Published by Houghton Mifflin Company. [There is an edition in Spanish: *Silent Spring*, Crítica, 2016] *N. from t.*

[f] Oil spill in early 1969 near Santa Barbara, California. It is the third largest oil spill in US history, to date. *N. from t.*

[g] The author refers to one of the several historical episodes in which said river, due to the high density of contamination that its waters carried, literally caught fire. *N. from t.*

[h] “Gray wolf” in the original. “Gray wolf” is an expression commonly used in English to refer to wolves in general, *Canis lupus*, regardless of their color. *N. from t.*

[i] “Mountain lions” in the original. Typical way of referring to cougars, *Puma concolor*, in English. *N. from t.*

[j] *Ursus arctos*. *N. from t.*

[k] *Lynx rufus* and *Lynx canadensis*. *N. from t.*

[m] “The wild” in the original. *N. from t.*

[544][p] “The frontier” in the original. This term refers to the margins of the expansion of the United States in the North American territories, from the origin of European colonization until the beginning of the 20th century. *N. from t.*

[q] “Progressive political movement” in the original. In this text, the term “progressive” refers exclusively to that American political movement of the early 20th century. *N. from t.*

[545][] “Bureau of the Biological Survey” in the original. *N. from t.*

[547][] “Bureau of the Geological Survey” in the original. *N. from t.*

[548][] Rodents of the genus *Cynomys*. *N. from t.*

[549][] Refers to official economic incentive programs to promote the extermination of vermin.

[550][] *N. from t.*

[551][] “National Forests” in the original. They constitute a category of public forest areas protected and managed by the federal government of the United States. *N. from t.*

[553][] “Destruction of Wolves and Coyotes”. *N. from t.*

[554][aa] “National Forest Commission” in the original. *N. from t.*

[bb] “Tree farming” in the original. *N. from t.*

[555][] Lester Frank Ward (1841-1913) was an American botanist, paleontologist, and sociologist. He believed that society should be scientifically controlled and his ideas in this regard influenced the intellectuals of the progressive era. *N. from t.*

[dd] Charles Townshend, 2nd Viscount Townshend, (1674-1738) English statesman. Known as “Turnip” Townshend for his intense interest in the cultivation of turnips and for his role in the British Agricultural Revolution. *N. from t.*

[ee] Arthur Young (1741-1820), English writer expert on agricultural improvement. *N. from t.*

[ff] “Wise land use” in the original. *N. from t.*

[556][] “The Succession of Forest Trees” in original. *N. from t.*

[557][] “Game Management”. *N. from t.*

[560][pp] “The Ethics of the Land”. *N. from t.*

[qq] Among contemporary conservationist authors, such as Worster, the term “biocentrism”, despite its etymology (“bios” is Greek for life), is usually rather a synonym for “ecocentrism” (taking ecological systems and processes wild animals as a fundamental value) than of a staunch defense of individual life. *N. from t.*

[rr] See footnote mm in this same article. *N. from t.*

[tt] “Roadless” in the original. In nature conservation, the absence of roads and highways is one of the basic practical criteria used in assessing whether or to what degree an area is wilderness. *N. from t.*

[uu] “Where so designated” in the original. In reference to the fact that they were declared “wilderness”. *N. from t.*

[562][v] Gilbert White [<https://es.wikipedia.org/wiki/1720>](1720-1793), English clergyman, considered the first ecologist in England. *N. from t.*

ww “Unnatural” in the original. The translation of “unnatural” can be either “unnatural” (“unnatural”) or “unnatural”. Here it has been translated as “unnatural”, but it could just as well have been translated as “unnatural”, with the consequent difference in meaning. *N. from t.*

[564][] “Natural history: the forgotten science”. *N. from t.*

[zz] “Chickadees” in the original. Birds of the genus *Poecile*. *N. from t.*

[565][] “Garden snakes” in the original. Probably genus *Thamnophis*. *N. from t.*

[566][bbb] Refers to *The unanimous declaration of the thirteen United States of America*, the declaration of independence of the United States of America from the domination of Great Britain. *N. from t.*

[567][ccc] “To keep every cog and wheel [...] is the first precaution of intelligent tinkering” in the original. It refers to the fact that if you get entangled with a machine by disassembling it, you have to be careful not to lose any part in order to reassemble it and keep it working. It is a famous phrase of Leopold. *N. from t.*

[602] “Wilderness” in the original. *N. from t.*

[616][] Translation by Último Reducto. © for translation, 2014, Último Reducto. *Translator’s note.*

[617][] This interview was conducted by telephone on April 2, 2012, by Dr. David Skrbina. It all started when Dr. Skrbina informed a group of Spanish people that Dave Foreman would attend one of the philosophy of technology classes that he teaches at the University of Michigan as a guest, and he offered to ask Foreman the questions that we will send you. Unfortunately, Foreman had an accident and was unable to keep the appointment, so he had to answer Skrbina’s questions later on the phone. The final interview is a fairly loose adaptation of the original series of questions we sent to Skrbina. Regardless, we thank Dr. Skrbina for conducting the interview, him and his wife for transcribing it, and Dave Foreman for taking the time to answer it.

[618][] The editors do not necessarily identify with Foreman’s responses. *Editors note.*

[619][] Mary Byrd Davis (ed.), *Eastern Old-Growth Forests. Prospects for Rediscovery and Recovery*, Island Press, 1996. *N. from trans.*

[647][] “Throughput” in the original. The translation of this term is problematic, because it can refer to different concepts depending on the context. For example, it can mean “production”, “productivity” or “yield”, depending on the case. In this text it has been translated in different ways depending on the occasion, indicating it in a footnote in each case. *N. from t.*

[d] Acronym for the Organization for Economic Co-operation and Development. “OECD” in the original. *N. from t.*

[e] “UNEP” in the original. *N. from t.*

[f] “*Towards Green Growth*” in the original. *N. from t.*

[g] “*Toward a Green Economy: Pathways to Sustainable Development and Poverty Eradication*” in the original. *N. from t.*

[h] “*Inclusive Green Growth: The Pathway to Sustainable Development*” in the original. *N. from t.*

[i] “Global Green Growth Institute” in the original. *N. from t.*

[j] “Green Growth Knowledge Platform” in the original. *N. from t.*

[648][] “„Domestic material consumption’ (DMC)” in the original. *N. from t.*

m “„Material footprint’ or MF” in the original. *N. from t.*

[n] “Re-coupling” in the original. *N. from t.*

[651][] “Throughput” in the original. *N. from t.*

[652][]u “„Busmess as usual’ scenario” in the original. *N. from t.*

[653][] Acronym for “Business-as-usual”. *N. del .t.*

[654][] “68 billion tons” in the original. *N. from t.*

[and] “93 billion tons” in the original. *N. from t.*

[z] “79.4 billion tons” in the original. *N. from t.*

[aa] “183 billion tons” in the original. *N. from t.*

[bb] “130 billion tons” in the original. *N. del .t.*

[656][] “Output” in the original. “Output”, like “throughput”, can mean “production” or “productivity”, depending on the case. Throughout the text it has been translated in different ways depending on the context, indicating it in each case in a footnote. *N. from t.*

[658][] *Idem.* *N. from t.*

[kk] *Idem.* *N. from t.*

[660][] “Global Carbon Budget” in the original. *N. from t.*

[661][][oo] “Fifth Assessment Report (AR5)” in the original. *N. from t.*

[pp] Acronym for the “Intergovernmental Panel on Climate Change”. “IPCC” in the original. *N. from t.*

[qq] “Representative Concentration Pathway 2.6 (RCP2.6)” in the original. *N. from t.*

[rr] “Shared Socio-Economic Pathways (SSPs)” in the original. *N. from t.*

[tt] “CCS” in the original. Supposedly it would be the acronym for “Carbon capture and Storage” (“Carbon Capture and Storage”), which is why they have been translated here as “CAC”. *N. from t.*

[uu] “Global CCS Institute” in the original. *N. from t.*

vv “European Academies’ Science Advisory Council” in the original. *N. from t.*

[664][] “UNFCCC” in the original. The authors are probably referring to the “UNFCCC”, an acronym for the United Nations Framework Convention on Climate Change, United Nations Framework Convention on Climate Change. *N. from t.*

[665]] “Low Energy Demand (LED)” in the original. *N. from t.*

[666]] “Output” in the original. *N. from t.*

[667]] “Throughput” in the original. *N. from t.*

[668]] “Throughput and output” in the original. *N. from t.*

[jjj] The authors refer to the following: according to the typical understanding of the I=PAT equation, A is defined as C/P and T as I/C, where C is the consumption of natural resources. Therefore, $I=P.(C/P).(I/C)$ which turns out to be $I=I$; that is, a truism. *N. from t.*

[kkk] *Idem. N. from t.*

[mmm] *Idem. N. from t.*

[nnn] *Idem. N. from t.*

[ooo] “Coupling” in the original. See footnote eee. *N. from t.*

[ppp] “Throughput” in the original. *N. from t.*

[qqq] *Idem. N. from t.*

[rrr] *Idem. N. from t.*

[ttt] “Output” in the original. *N. from t.*

[uuu] “Uncoupled” in the original. Following the line of the rest of the translation, it has been decided to translate “uncoupled” as “not coupled”. Other possible translations would be “not linked” or “not associated”. *N. from t.*

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[701]]and, at the same time, at a higher level of consciousness until reaching the “omega point”, a kind of superconsciousness in which all human consciousness would participate. *N. from t.*

[a] Translation and adaptation by Último Reducto of a fragment of Chapter 2, “When Things Bite Back: Some Unintended Consequences of Modern Technology”, from the book by the authors *TechNo-Fix* (New Society Publishers, 2011). Copyright © 2011 Michael Huesemann and Joyce Huesemann. *N. from t.*

- “HT” is “Higher Technology”.

- “HCC” stands for “Higher Carrying Capacity”.

- “HP” is “Higher Population”.

- “HA” is “Higher Affluence”.

- “HI” is “Higher Impact”.

N. from t.

[716]] In chapter 4 of the book from which this text comes, the authors explain what these Seven Ecological Wounds are:

1. Excessive capture of certain species.
2. Destruction and domestication of wild lands.
3. Fragmentation of wildlife habitats.
4. Disturbance and weakening of ecological and evolutionary processes.
5. Expansion of foreign species and diseases.
6. Biocidal poisoning of soil, air, water and wildlife.
7. Climate change and ocean acidification.

N. from t.

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-autntica-idea-de-la-naturaleza-salvaje>][(<http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/la-authentic-idea-de-la-naturaleza>)] [<http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/la-authentic-idea-of-wild-nature>][wild)], “Against the social construction of wild nature” by Eileen Crist [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/contra-la-construccin-social-de-la-naturaleza>][(<http://www.naturalezaindomita.com/texto/naturaleza-salvaje-y-teora-ecocntrica/contra-la-construccin-social-de-la-naturaleza>)] or Donald Worster’s “Wild Lands of History” [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/las-tierras-salvajes-de-la-historia>][(<http://www.naturalezaindomita.com/textos/naturaleza-wild-and-ecocentric-theory/the-wild-lands-of-history>)], in *Indomitable Nature*. [<http://www.naturalezaindomita.com/resenas/discordant-harmonies>][(<http://www.naturalezaindomita.com/resenas/discordant-harmonies>)].

[<https://lareviewofbooks.org/article/is-there-need-for-the-new-wild-the-new-ecological-quarrels>][quarrels.] *N. from t.*

All this complicates the definition and interpretation of the concept to which *Último Reducto* refers with said term. However, the important thing here is to try to express, clarify and capture said *concept* without getting lost in discussing what to call it. Let everyone name it as they want and can.

Despite the fact that the ideology of techno-industrial society (and, with it, in a good part of leftist discourses) tends to promote, at a *theoretical* level, an indiscriminate expanded solidarity (towards all beings), human beings, or even beyond), in *practice*, due to the physical limitations imposed by Nature in general, and the psychological limitations imposed by human nature in particular, expanded solidarity is not usually applied indiscriminately, but only with respect to human groups or restricted social environments.

[795] text has been translated as “guardianship” or “custody”. *N. from t.*

[796] Here the author, who is from the United States, by “fire suppression” refers to the practices of prevention and extinction of forest fires in ecosystems that actually depend on the production of non-artificial fires with certain frequency (fire regime) to maintain and

[797] complete their self-regulatory dynamics, their integrity and their wild character. Not all wildfires are bad for ecosystems. *N. from t.*

[798][n] “Wilderness” in the original. *N. from t.*

[799][or] “Forest Service” in the original. Refers to the United States Forest Service (*US Forest Service*). *N. from t.*

[p] BLM” in the original. Acronym for “Bureau of Land Management”, an administrative entity of the United States. *N. from t.*

[q] “Stewards” in the original. See footnote g in this same text. *N. from t.*

[r] “Landscape” in the original. *N. from t.*

[801]] *Idem. N. from t.*

[u] *Idem. N. from t.*

[w] Here the author refers to one of the etymologies often proposed for the English term “wilderness”: “willed-deor-ness”, being *willed* “with will”, that is to say , autonomous or wild; Old English *deor* “beast”; and *ness* “place” or “land” in Old English. This etymology is the one given by Vest in the article cited as a reference in note 4 of this text. *N. from t.*

[and] *Idem. N. from t.*

[z] The Wildlands Project (now known as The Wildlands Network), a US conservation organization that advocates for the protection of large wilderness areas linked by biological corridors on a continental scale. *N. from t.*

[aa] “Wilderness” in the original. *N. from t.*

[bb] There is an edition in Spanish: *The origins of the State and civilization: the process of cultural evolution*, Alianza Editorial, 1984. *N. from t.*

[cc] There is a Spanish edition: *The food crisis in prehistory*, Alianza Editorial, 1981. *N. from t.*

[804]] There is a Spanish edition: *The third chimpanzee*, Debate, 2007. *N. from t.*

[ee] There is an edition in Spanish: *Death, sex and fertility*, Alianza Editorial, 1991. *N. of the t.*

[ff] There is a Spanish edition: *Cultural materialism*, Alianza Editorial, 1985. *N. from t.*

[gg] “Wild areas” in the original. *N. from t.*

[hh] “Matrix” in the original. The author is surely referring to the fact that wild places should occupy much larger areas, occupying most of the territory and surrounding humanized areas, and not vice versa as is the case today. *N. from t.*

[ii] There is a Spanish edition: *What is sex?*, Tusquets, 1998. *N. from t.*

And there would be more such examples scattered throughout the author’s work, despite some unclear and successful attempts to deny the evidence on his part.

[<https://www.revistaecosistemas.net/index.php/ecosistemas/article/view/313/308>][<https://www.revistaecosistemas.net/index.php/ecosistemas/article/view/313/308>]

[808]] “Greater Yellowstone Ecosystem” in the original. It is the name by which an area of the

[809]] Rocky Mountains, in the western United States, including Yellowstone National Park and the

[810]] surrounding areas. *N. from t.*

[811]] “Pocket gophers” in the original. Rodents of the family Geomyidae. *N. from t.*

[j] The *Sierra Club* is one of the leading conservation organizations in the United States. *N. del t.* [k] Remember that the original text was published in 1993.

[m] Acronym for “Massachusetts Technological Institute”, Massachusetts Institute of Technology. *N. from t.*

[t] There is an edition in Spanish: Chaos: the creation of a new science, Crítica, 2012. *N. from t.*

[815][https://es.wikipedia.org/wiki/Ley_de_%c3%81reas_Salvajes][[https://es.wikipedia.org/wiki/Ley de Areas Salvajes](https://es.wikipedia.org/wiki/Ley_de_Areas_Salvajes).]

[819][[<https://vieja.patrimonionatural.org/noticias/general/2020/10/28/leon-acagera-un-centro-homologado-para-la-practica-de-mountain-bike-con-more-de-320-km-de-rutas>][<https://vieja.patrimonionatural.org/noticias/general/2020/10/28/leon-acagera-un->

<https://vieja.patrimonionatural.org/noticias/general/2020/10/28/leon-acagera-un-centro-homologado-para-la-practica-de-mountain-bike-con-more-de-320-km-of-routes>][approved-centre-for-the-practice-of-mountain-bike-with-more-than-320-km-of-routes]

[<https://patrimonionatural.org/noticias/noticia/sale-a-licitacion-la-construccion-del-mirador-de-aldeadavila-un-nuevo-atractivo-en-arribes-duero>][<https://patrimonionatural.org/news/news/goes-out-for-tendering-the-construction-of>]

[<https://patrimonionatural.org/noticias/noticia/sale-a-licitacion-la-construccion-del-mirador-de-aldeadavila-a-new-atractive-in-arribes-duero>][mirador-de-aldeadavila-a-new-attraction-in-arribes-duero.]

The first news is about the creation of several hundred kilometers of mountain bike routes, in the heart of the Cantabrian Mountains, reopening tracks and paths that were being “lost”, that is, they were being recovered by wild nature. Small mammals, amphibians, reptiles and invertebrates for which tracks and slopes are often an impassable barrier or who are crushed to death by road traffic (and this includes bicycles), coupled with habitat fragmentation or erosion that generates the creation and existence of tracks or paths, have been left in the background. Alto Bernesga is an area currently declared a “Special Conservation Area” of the Natura 2000 Network and a “Biosphere Reserve ” (Siglo Foundation, 2018).

The second piece of news is about the construction of a new viewpoint, with a platform on the air, parking and a pedestrian path, in the Arribes del Duero. It seems that there were “only” three viewpoints in the area and another one had to be built. The Arribes del Duero is currently declared a “Natural Park” (Reyero, 2007) and a “Biosphere Reserve” (Siglo Foundation, 2018).

[820][wild”, with “potential for integration into the dynamics of ecosystems” and “enhancing the conservation of many of the most valuable habitats”. The second article speaks of a “new forestry” that, in theory, will make the extraction of wood from forests compatible with the conservation of saproxylic organisms, and that the author proposes as an alternative to conventional forest exploitation.

[831][[831]] **Hitting the nail on the head.**

[832][[832]] **Conclusions.**

[833] The assessment that can be made of these books (or, more generally, of the way of thinking

[834] by James Lovelock) from a perspective of respect for wild Nature and rejection of

[835] the techno-industrial society is frankly negative. A priori, they appear to be arguments in favor of

[836] a self-regulated Nature, like almost everything that is made public under the banner of

[837] environmentalism. But that apparent greenery hides a black background like that of a firebrand: it

[838] actually deals with arguments in favor of modern industrial civilization, as I have

[839] tried to show throughout this review, I hope with more than enough examples.

[840] Certainly, within the current human civilization, some places can be preserved

[841] semi-wild, or some autonomy in the behavior of individuals and small

[842] human groups, but when a conflict of interest appears between Wild Nature

[843] g —Wilderness” in the original. Wilderness in English comes to mean —lands or ecosystems not at all or barely humanized”. So, in this case, it is most likely a typographical error, since, depending on the context, the authors here would rather be referring to the —wildness”, that is, to the —wild character” of the ecosystems, or more specifically in this case to the ”degree of conservation of the wild character” of the same. It has been corrected in the text. *N. from t.*

[h] —Intactness” in the original. *N. from t.*

[j] —Forest wildlands” in the original.” *N. from t.*

[k] —Forest” in the original. *N. from t.*

[846] —The highest proportion of intactness” in the original. *N. from t.*

[847] or “Forest Stewardship Council” in the original. *N. del. t*

[848] p “Forest wildlands” in the original. *N. from t.*

[850] In order not to affect the correct appreciation of the images, the superimposed texts have been left untranslated: “IFL 2000” means “PFI in 2000” and “IFL 2013” means “PFI in 2013” . *N. from t.*

[852] *Idem. N. del .t.*

Thus, left’s historic struggles for “equality” helped the system to function more efficiently.

[884] the social organization. Child raising has especially important consequences, because childhood is the time frame in which society can socialize its members and instill its values most effectively. And as it is done more and more by the institutions of the system (kindergartens, schools, etc.) instead of by the family and a small circle of known and close-to-family trusted people, techno-industrial system becomes more efficient inculcating its values to the new generations.

[<https://drive.google.com/file/d/1xwsGIePMbN9XCZH4GVjhd0xpdCdYL7UG/view>][(<https://drive.google.com/file/d/1xwsGIePMbN9XCZH4GVjhd0xpdCdYL7UG/view>)].

All this complicates the definition and interpretation of the concept to which Ultimo Reductio is referring to with the term “leftism.” However, the point here is trying to express, clarify and grasp the concept without getting lost in discussions about what to call it. Let each denominate the concept as he is best willing and able.

In spite of that the ideology of techno-industrial society (and, with it, much of the leftist rhetoric) tends to promote, *theoretically*, an indiscriminate type of extended solidarity (towards every human being, or even beyond), *in practice*, because of the limitations imposed by Nature in general, and the psychological restrictions imposed by human nature in particular, extended

[897][solidarity does not use to be put in place indiscriminately, but only in regard to restricted human groups and social environments.

Indomitable Nature:[<https://www.naturalezaindomita.com/textos/ecologia/la-dominacin-humana-de-los-ecosistemas-de-la-tierra>][<https://www.naturalezaindomita.com/textos/ecologia/the-domination->

[<https://www.naturalezaindomita.com/textos/ecologia/la-dominacin-humana-de-los-ecosistemas-de-la-tierra>][human-de-los-ecosistemas-de-la-tierra.] < em>N. from t.

[a] Translation by Baldo of “Limits-to-Growth and the Biodiversity Crisis”, originally published in *Wild Earth*, vol. 13, no. 1, 2003. Eileen Crist is associate professor of studies in science and technology at Virginia Tech, in Blacksburg, Virginia. She is the author of *Images of Animals: Anthropomorphism and Animal Mind. Translator’s note.*

[b] “Overshoot” in the original. Carrying capacity is a concept that refers to the maximum population of a species that an environment is capable of supporting permanently. *N. of the trad.*

[c] The name comes from Greek mythology. In it, a cornucopia was called a ram’s horn overflowing with fruit, grains, vegetables and other goods that never ran out. *N. of the trad.*

[928][“wild”. *N. from t.*

[m] “Supervene on” in the original. In philosophy, “supervening from” means “coming determined by” or “depending on.” *N. from t.*

[n] “Neolithic” in the original. It seems that this is a slip and the author actually meant to write “paleolithic” (“paleolithic”). Mammoths were already extinct in most of the world when the Neolithic began in parts of Eurasia. *N. from t.*

[o] Small town in Massachusetts where the writer Henry David Thoreau was born and lived for most of his life. *N. from t.*

[p] “Old McDonald’s farm” in the original. It references a popular American children’s song about a traditional pre-industrial farm. *N. from t.*

[929][“Wild” in original. *N. from t.*

[j] “The ferocious, the unruly, the agitated, or the disorderly” in the original. *N. from t.*

[k] “Old growth forest” in the original. *N. from t.*

[931] ecosystems that, being initially domesticated, become feral, that is, return to the wild state

[932] from domesticity. In the case of humans, it would refer to lost or abandoned children

[933] who apparently grew up without contact with any human society. In this text it will be translated as

b) I don’t know for sure the name of the author. I have deduced it from other similar texts that appear on the Internet. *N. from t.*

c) This is exclusively a fragment of the original article. *N. from t.*

[949] “to end up being”. It probably refers to “end up being part of the natural environment or life”, that is why I have translated it: “to be becoming part of it”. *N. from t.*

[956] Last updated on June 18, 2010. We recommend readers to first consult the text “Slom industrijskih drustava” (2010) [“The Great Turning Point”] (also on our [<https://www.isp.hr/~tmarkus/>] [website]), because we have not explained certain terms and attitudes here.

Adaptation to English of Zemlja na raskrscu: Hrvatska i kraj ere fosilnih goriva [<https://www.isp.hr/~tmarkus/HRVATSKA%20I%20OIL%20PEAK.pdf>] [(<https://www.isp.hr/~tmarkus/HRVATSKA%20I%20OIL%20PEAK.pdf>)], from a translation from Croatian made with Google Translate. Adapted by Ultimo Reducto. *Translator’s Note.*

2009).

[a] Translation by Último Reducto of “Two Roads Diverging: Integral Theory and Contemporary Science” published in Integral World (2009): [<http://www.integralworld.net/markus2.html>] [<http://www.integralworld.net/markus2.html>]. *N. from t.*

[963] “Progressive” in the original. This English term can be translated either as “progressive” or as “progressive”. It has been considered that “progressive” is the most appropriate translation in this text. *N. from t.*

[c] “Pop-evolutionism” in the original. *N. from t.*

[d] “Civilization- and industrial-centric” in the original. *N. from t.*

[964] “Enlightment” in the original. This term can mean either “enlightenment” or “enlightenment” depending on the context, and consequently, in this text, it has been translated one way or another depending on the situation. *N. from t.*

[h] “Unnatural” in the original. The English term “unnatural” can be translated either merely as “unnatural” or “non-natural” or else as “unnatural” or “contrary to nature”. The second meaning is usually the most frequent. In this text it has also been translated in the latter way. *N. from t.*

[966][] “Flatland” in the original. In reference to Edwin Abbott Abbott’s novel, *Flatland* (1884, Seeley & Co.) which takes place in a fictional two-dimensional world. This novel pretends to be a social criticism (the inhabitants of Flatland would be limited by the two-dimensionality of their world that would prevent them from recognizing the existence of a third dimension). There is an edition in Spanish: *Planilandia* (Olañeta, [967][]1999). *N. from t.*

[968][] The perennial philosophy is a set of metaphysical ideas that develops, from the sixteenth century and that

[969][] defends the existence of a universal set of truths and values common to all peoples and

[970][] cultures, which underlies all religions and, in particular, the mystical currents within them. *N. from t.*

[972][][p] There is a Spanish translation: *General overview of modern science*, Crítica, Barcelona, 2007. *N. from t.*

[q] There is a Spanish translation: *The Crucial Point: Science, Society, and Nascent Culture*, Editorial Pax, Mexico, 1998. *N. from t.*

[r] There is a Spanish translation: *The development of anthropological theory: history of cultural theories*, 21st century, 1979. *N. from t.*

[t] There is a Spanish translation: “The limits of spiritual illumination”:

[<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-iluminacin-espiritual>][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los->][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-iluminacin-espiritual>][limits-of-spiritual-enlightenment].*N. from t.*

[u] There is a Spanish translation: *The rebirth of nature, the new image of science and God*, Paidós, Barcelona, 1994. *N. from t.*

[974][] “Enlightment” in the original. This term can mean either “enlightenment” or “enlightenment”

[975][] according to the context, and consequently, in this text, it has been translated one way or another depending on

[976][] the situation. *N. from t.*

[977][] “Progressive” in the original. This English term can be translated either as “progressive” or as “progressive”. It has been considered that “progressive” is the most appropriate translation in this text. *N. from t.*

[j] “Flatland” in the original. In reference to Edwin Abbott Abbott’s novel, *Flatland* (1884, Seeley & Co.) which takes place in a fictional two-dimensional world. Said novel pretends to be a social critique (the inhabitants of Flatland would be limited by the two-dimensionality of their world that would prevent them from

[979][] recognize the existence of a third dimension). There is an edition in Spanish: *Planilandia* (Olañeta, 1999). *N. from t.*

[k] The perennial philosophy is a set of metaphysical ideas that develops from the sixteenth century and defends the existence of a universal set of truths and values

common to all peoples and cultures, which underlies all religions and, in particular, behind the mystical currents within them. *N. from t.*

[m] From *noos*, intelligence or mind in Greek. Certain Novoeran "thinkers" use this term to refer to the group formed by intelligent beings or their minds; It would be something similar to the biosphere, but taking into account only those beings that are intelligent. *N. from t.*

[n] There is a Spanish translation: *Exceeded: the ecological bases for a revolutionary change*, Océano, Mexico DF, 2010. *N. from t.*

[o] There is a Spanish translation: *The ecology of ancient civilizations*, Fondo de Cultura económica, Spain, 1981. *N. from t.*

[p] There is a Spanish translation: "The limits of spiritual illumination":

[<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-iluminacin-espiritual>][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los->][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/the-limits-of-spiritual-enlightenment>][limits-of-spiritual-enlightenment.] *N. from t.*

[q] There is a Spanish translation: *Something new under the sun. Environmental history of the world in the 20th century*, Alianza Editorial, Madrid, 2011. *N. from t.*

[r] There is a Spanish translation: *Integral Spirituality*, Kairós, Barcelona, 2016. *N. from t.*

[a] Translation by Último Reducto of "Pitfalls of Wilberian Ecology: A critical review of *Integral Ecology*" (2009). The original article in English can be read at *Integral World*:

[<http://www.integralworld.net/markus4.html>][<http://www.integralworld.net/markus4.html>.] *N. from t.*

[b] For a presentation of this review see: "Presentation of 'The limits of spiritual enlightenment', 'Two divergent paths' and 'the twilight of the integral world'" in Wild Nature:

[<https://sites.google.com/site/indomitismo/los-lmites-de-la-illuminacin-espiritual-dos-caminos-divergentes-el-ocaso-del-mundo-integral>][<https://sites.google.com/site/indomitismo/los-lmites-de-la-illuminacin-espiritual-dos-caminos-divergentes->][<https://sites.google.com/site/indomitismo/los-lmites-de-la-spiritual-enlightenment-two-divergent-paths-the-twilight-of-the-integral-world>][the-twilight-of-the-integral-world.] *N. from t.*

[c] Kenneth Earl Wilber II (1949-), is an American biochemist and writer who founded the so-called "Integral Theory". Drawing on a host of thinkers from Plato and Aurobindo to Hegel and Piaget, as well as his own meditative practices, Ken Wilber posits integral theory as a synthesis between modern science and traditional spirituality aimed at achieving a greater understanding of reality. cosmic, biotic, human and divine evolution. *N. from trans.*

[d] "AQAL (all quadrants, all levels)" in original. *N. from t.*

[e] "I" in the original. *N. of the t.*

[f] "IT" in the original. *N. of the t.*

[g] “WE” in the original. *N of the t.*

[h] “STIs” in the original. *N of the t.*

[981] “Regressivism” in the original. *N of the t.*

[j] “Flatland” in the original. In reference to Edwin Abbott Abbott’s novel, *Flatland* (1884, Seeley & Co.) which takes place in a fictional two-dimensional world. This novel pretends to be a social criticism (the inhabitants of Flatland would be limited by the two-dimensionality of their society that would prevent them from recognizing the existence of a third dimension). There is an edition in Spanish: *Planilandia* (Olañeta, 1999). *N. from t.*

[k] “Progressive” in the original. This English term can be translated either as “progressive” or as “progressive”. It has been considered that “progressive” is the most appropriate translation in this text. *N. from t.*

[983] “Enlightment” in the original. This term can mean either “enlightenment” or “enlightenment” depending on the context, and consequently, in this text, it has been translated one way or another depending on the situation. *N. from t.*

[985] There is a Spanish translation: “The limits of spiritual illumination”:

[986] [<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-illuminacin-espiritual>][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los->]

[987] [<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-illuminacin-espiritual>][limits-of -the-spiritual-enlightenment.] *N. from t.*

[988] There is a Spanish translation: “Two divergent paths”:[<http://www.naturalezaindomita.com/dos-caminos-divergentes>][<http://www.naturalezaindomita.com/dos->][<http://www.naturalezaindomita.com/dos-caminos-divergentes>][caminos-divergentes.] *N. from t.*

[989] There is a Spanish translation: “The decline of the integral world”:[<http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral>][<http://www.naturalezaindomita.com/el->][<http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral>][ocaso-del-mundo-integral.] *N. from t.*

[and] There is a Spanish translation: *Brief history of all things*, Kairós, Barcelona, 1997. *N. from t.*

N. from t.

[1014] Translation by Último Reducto of “Welcome Home To The Pleistocene. Paul Shepard’s Ecological Philosophy” ([<https://www.isp.hr/~tmarkus/PAUL%20SHEPARD.pdf>][<https://www.isp.hr/~tmarkus/PAUL%20SHEPARD.pdf>]). *N. of t.*

[1026] Shepard 1998c:121

[1082] Shepard 1997:98, 140-152 and 284-289.

translator.

Lee’s book documents the push and pull of this splitting process. *N. from t.*

[1154] Layer of frozen ground that covers arctic latitudes. *N. from t.*

[1155]] —Global heating” in the original. It has been translated as ”global warming” to differentiate it from the expression ”global warming” which is the one usually used in English to refer to global warming. *N. from t.*

[1156]] —Wilderness” in the original. This term refers to areas with little or no humanization. Depending on the context, it can be translated in various ways. In this text, it has been translated as “wild nature”, unless otherwise indicated. *N. from t.*

[g] —Wilderness” in the original. *N. from t.*

[m] There is an edition in Spanish: *The coming catastrophe: notes from the climate change front*, Planeta, 2008. *N. of the t.*

[1159]] [n] “Committee on Oversight and Government Reform” in the original. *T.N.* or —US House of Representatives” in the original. *N. of the t.*

[p] There is a Spanish translation: *The limits of growth*, Fondo de Cultura Económica, 1973. *N. from t.*

[q] There is a Spanish translation: *The population explosion*. Salvat, 1993. *N. from t.*

[r] There is a Spanish translation: *The Earth’s Revenge*, Editorial Planeta, 2007. *N. from t.*

[1161]] There is an edition in Spanish: *La diversity de la vida*, Crítica, 2001 *N. of t.*

[1162]] There is an edition in Spanish: *El fin de la Naturaleza*, Ediciones B, 1990. *N. of t.*

[and] There is an edition in Spanish: *The future of life*, Galaxia Guttenberg, 2003. *N. of t.*

[z] There is a Spanish edition: *The enemy of nature: the end of capitalism or the end of the world?*, Thesis 11 Grupo Editor, 2005. *N. of t.*

[1164]] —Wise use” in the original. *N. from t.*

[hh] There is a Spanish translation: *Gaia: a science to heal the planet*, Integral, 1992. *N. of t.*

[jj] There is a Spanish translation: *Social Theory and Structure*, Fondo de Cultura Económica, 2003. *N. del t.*

<https://www.youtube.com/watch?v=ZmAqKsasNKk&list=WL&index=48&t=3s>; the interview “The UNABOMBER, Post-Tech Society & Metaphysics of Technology w/ David Skrbina”, in *Last Born In The Wilderness* podcast #73

<https://soundcloud.com/lastborninthewilderness/episode-73-david-skrbina>; the interview appeared on the North Carolina Public Radio program “The story”, on March 20, 2013: “Penpals with Unabomber” (it is deleted from the NCPR website, but it can still be listened to at:<https://archive.org/details/20130320PenpalsWithUnabomber>][<https://archive.org/details/20130320PenpalsWithUnabomber>]; and the article “The

Unabomber's Pen Pal" by Jeffrey R. Young, in *The Chronicle of Higher Education*, May 20, 2012 [<https://www.chronicle.com/article/The-Unabombers-Pen-Pal/131892/>] [<https://www.chronicle.com/article/The-Unabombers-Pen-Pal/131892/>].

[1180]

(pages 273-274).

[1215][i] "Passenger pigeon" in the original. *Migratory ectopists*. *N. from t.*

[j] The author refers to North American butterflies of the genus *Hemaris*. *N. from t.*

[k] *Procyon lotor*. *N. of t.*

[m] Family *Mephitidae*. *N. of t.*

[n] *Myotis lucifugus*. *N. from t.*

[or] Infection caused by the fungus *Pseudogymnoascus destructans* that affects the snout and wings of North American species of hibernating bats. It is believed that it was introduced from Europe. *N. from t.*

[p] "Emerald ash bore" in the original. *Agrilus planipennis*. *N. of t.*

[1217][i] "White ashes" in the original. *Fraxinus americana*. *N. of t.*

[r] "Meadow mushrooms" in the original. *Agaricus campestris*. *N. of t.*

[t] "Least Concern" in original. Corresponds to the LC category. *N. of t.*

[u] "Critically Endangered" in the original. Corresponds to the CR category. *N. of t.*

[v] "Extinct in the wild" in the original. Corresponds to the EW category. *N. of t.*

[w] "Hawaiian crow" in the original. *Corvus hawaiiensis*. *N. of t.*

[x] "Extinct" in the original. Corresponds to the EX category. *N. of t.* [and] "Hump-head wrasse" in the original. *Cheilinus undulatus*. *N. from t.* [z] "Common sawfish" in the original. *Pristis pristis*. *N. from t.*

[aa] "Eastern long-beaked echidna" in the original. *Zaglossus bartoni*. *N. from t.*

[bb] There are various editions in Spanish under the title: *The lost paradise*. *N. from t.*

[1219][i] In reference to the fact that the Earth's orbit is located at such a distance from the Sun that it can be kept "neither too cold nor too hot", like the porridge that Ricitos de Mar eats

[1220][i] Gold in the famous children's story. *N. from t.*

[mm] "Ice-sheet Mass Balance Inter-comparison Exercise" or Exercise for the Comparison of the Mass Balance between the Ice Layers. *N. from t.*

[nn] There are multiple editions in Spanish, under the titles: *Essay on the principle of population* or *First essay on population*. *N. from t.*

[1222][i] There is a Spanish edition: *Middlemarch, a study of life in the provinces*, Alba Editorial, 2013. *N. from t.*

[tt] There is an edition in Spanish: *Biophilia: love of nature or that which makes us human*, Errata Naturae, 2021. *N. from t.*

[uu] There are various editions in Spanish with the title: *Waiting for Godot*. *N. of the t.*

- [vv] There are various editions in Spanish with the title: *La Orestiada*. *N. from t.*
- [1242][] “Wilderness” in the original. Although it generally refers to wild areas or ecosystems, that is, little or no humanization, the translation of “wilderness” into Spanish can vary depending on the context. In this text it has been translated as “wild areas”, “wilderness areas” or “wilderness lands”, except where explicitly indicated. *N. del t.* [d] “Wilderness” in the original. *N. from t.*
- [e] *Idem. N. from t.*
- [f] *Idem. N. from t.*
- [g] *Idem. N. from t.*
- [h] *Ditto. N. from t.*
- [i] US law regulating the protection of wilderness areas. *N. from t.*
- [j] 1 acre is approximately equal to 0.4 hectares. *N. from t.*
- [k] “Game carts” in the original. It refers to a kind of cart that is used to transport the pieces of big game. *N. from t.*
- [m] “National Park Service” in the original. *N. from t.*
- [n] “US Fish and Wildlife Service” in original. *N. from t.*
- [or] “Bureau of Land Management” in the original. *N. from t.*
- [1244][][p] “Wilderness” in the original. *N. from t.*
- [q] *Idem. N. from t.*
- [r] *Idem. N. from t.*
- [t] “Self-willed-land” in the original. *N. del.t.*
- [u] “Home of wild beasts” in the original. It refers to “wild-deor-ness,” where “deor” is an Old English term for “animal.” *N. from t.*
- [v] “Wilderness” in the original. *N. from t.*
- [w] “Wilderness landscapes” in the original. *N. from t.*
- [x] “Wilderness” in the original. *N. from t.*
- [and] “Plenty of wildness” in the original. “Wildness” in principle refers to the wild character of something, although depending on the context it could be translated in other ways. *N. from t.*
- [z] “Wildness” in the original. *N. from t.*
- [1246][] “De-wild” in the original. *N. from t.*
- [hh] “Wilderness idea” in the original. *N. from t.*
- [ii] *Idem. N. of the t.*
- [jj] “Wilderness amnesia” in the original. *N. from t.*
- [kk] “Wilderness” in the original. *N. from t.*
- [mm] *Idem. N. of the t.*
- [nn] “Wilderness landscape” in the original. *N. from t.*
- [oo] “Wilderness” in the original. *N. from t.*
- [1248][][pp] *Idem. N. of the t.*
- [qq] *Idem. N. of the t.*
- [rr] *Idem. N. of the t.*
- [tt] “Wilderness guide/outfitter” in the original. *N. from t.*

[uu] “Wilderness” in the original. *N. from t.*
<http://www.onlineopinion.com.au/view.asp?article=10145&page=0>[22/10/2015 12:31:34 PM] and
[\[https://www.colongwilderness.org.au/files/pages/prof-buckley-wilderness-and-tourism.pdf\]](https://www.colongwilderness.org.au/files/pages/prof-buckley-wilderness-and-tourism.pdf)[<https://www.colongwilderness.org.au/files/pages/prof-buckley-wilderness-and-tourism.pdf>,] respectively). © 2010, Ralph Buckley. *N. from t.*

[1263][] “Working forest” in the original. It is probably an error of the author and he wanted to refer to “working landscape”, so it has been translated as “productive landscape”. *N. from t.*

[j] One of the largest environmental organizations in the United States. *N. from t.*

[k] “Wealthy countries such as the United States are loving many of their forests to death with a lack of active stewardship” in the original. *N. from t.*

[m] *Ditto. N. of the t.*

[n] “Working” in the original. See footnote b. *N. from t.*

[or] “Working forests” in the original. *N. from t.*

[p] “Land trusts” in the original. *N. from t.*

[1265][] “Work the landscape” in the original. *N. of the t.*

[r] “Old growth forests” in the original. It refers to forests that are in their stage of maximum development or climax and that, therefore, have never been cut down or, at least, not for many years, or rather centuries. In Spanish it would be translated as “primary forests” *N. from t.*

[t] “Pavement” in the original. *N. of the t.*

[1267][] *Ovis canadensis. N. from t.*

[1268][] “Ancient or old growth” in the original. *N. from t.*

[1269][] “Working ecosystems” in the original. In this text, the same translation criteria have been followed for this expression.

[1270][] that for “working landscapes”, thus translating it as “productive ecosystems”. *N. from t.*

[1272][] “Wilderness areas” in the original. Refers to wilderness areas protected by the *Wildenness Act* in the United States. *N. from t.*

[1273][] “Wilderness” in the original. See footnote above. *N. from t.*

[1274][] “Artic National Wildlife Refuge” in original. *N. from t.*

[1275][] *Idem. N. from t.*

[1285] One acre is equal to about 4.047 square meters (0.4047[<http://en.wikipedia.org/wiki/Hectare>][hectares]). The equivalence is approximate since there are different types of acres, with slightly different values. *N. from t.*

☒ $dx/dt = x(a - Py)$ for the growth of the prey population.

☒ $Dy/dt = y(Sx - y)$ for predator population growth.

Being x the number of prey and y the number of predators. For its part, a would be the growth rate of prey in the absence of predators; P the susceptibility of the prey to be hunted; and the rate of decline of predators in the absence of prey; and S the predation capacity of the predator. *N. from t.*

[1316]] a more primitive experience. The oil age is only a passing historical problem, we are told: the terrible destruction of the environment, the suffocating modern wage slavery, the spiritual emptiness of the suburbs, the depression, anxiety and meaninglessness of modern experience, are all of them manifestations of a temporary experimentation of humanity with fossil fuels that is coming to an end. There will be great chaos and much suffering in the short term, but when the dust settles, the earth can at least relax, and man can be free. “[I]n the post-oil world, humanity will discover a way of life that is *psychologically more satisfying* as well as *ecologically more sustainable* than that which we have known during the era industrial”. Page 5 [italics added].

[<https://www.forbes.com/sites/michaellynch/2018/06/29/what-ever-happened-to-peak-oil/%237c43cb12731a>][<https://www.forbes.com/sites/michaellynch/2018/06/29/what-ever-happened-to-peak-oil/%237c43cb12731a>][<https://www.forbes.com/sites/michaellynch/2018/06/29/what-ever-happened-to-peak-oil/%237c43cb12731a>][oil/#7c43cb12731a.]

[1319]] Theodore Kaczynski, *Anti-Tech Revolution*, Scottsdale, AZ: Fitch&Madison Publishers, 2016, page 59. For a more systematic description of this process, see pages 60-64 in the same work.

This is astonishingly naive! However, it is also typical of the mental frame that scientists and technicians have been maintaining until today. The “properties and interrelationships of matter and energy”, namely the accumulated knowledge and increasingly advanced practice of science and technology are deeply dependent on, and interrelated with, “the associated monetary system”. Science and technology cannot be decoupled from society as easily as Hubbert and his fellow scientists seem to believe. It’s easy to see why they do: they can happily carry on with their “surrogate activities,” trying to advance their careers, achieve satisfaction, excitement, status, and prestige, while conveniently denying any of the unintended effects and detriments that inevitably result from the advancement of technology. By artificially separating the practice of science from society, they can criticize their little scapegoats (“Capitalism”, the “politicians”, the “monetary system”, etc.) while still merrily advancing technology.

This is also something incredibly naive. As long as oil can still provide, in terms of investment, a higher net energy yield than alternatives, it will continue to be used by the system as a whole.

[<https://soundcloud.com/lastborninthewilderness/episode-73-david-skrbina>][(<https://soundcloud.com/lastborninthewilderness/episode-73-david-skrbina>)]; the interview that appeared on the North Carolina Public Radio program “The story”, on March 20, 2013: “Penpals with Unabomber” (it was deleted from the NCPR website, but can still be heard at: [<https://archive.org/details/20130320PenpalsWithUnabomber>][<https://archive.org/details/20130320PenpalsWithUnabomber>]); and Jeffrey R. Young’s article “The Unabomber’s Pen Pal,” in *The Chronicle of Higher Education*, May 20, 2012 [<https://www.chronicle.com/article/The-Unabombers-Pen-Pal/131892/>][(<https://www.chronicle.com/article/The-Unabombers-Pen-Pal/131892/>)]. All of them in English.

[1341]] Page 13.

I am not anti-capitalist [...] the most anti-capitalist thing there is is capitalism [...] people who declare themselves anti-capitalist, I understand why they do it, but I think it is a mistake [...] in the end it is capitalism [...] what is important is the rising rate of capital.

After this gibberish, what is clear is that what one calls himself is one thing and what he is is another. What defines people deep down are their ideas and above all their facts, what they defend and what they don't, what they attack and what they don't, and not so much the terms they use to call themselves. If someone reduces everything to capitalism and considers capitalism as the ultimate cause of the main current evils (whatever he means by "evil"), he can call himself whatever comes out of his nose, which is clear what it is. In fact, another of the typical features of (post-) modern leftism, largely heir to Marxism, is playing with language and believing (and pretending to believe) that by manipulating it reality is modified.

Everything said in the previous paragraph is nothing more than a mere morally neutral description of the universal phenomenon of the intrinsic tendency to self-perpetuation and expansion in complex systems. At no time is this paragraph entering into a moral judgment of this phenomenon in general, nor its particular cases. Here it is only intended to point out that said phenomenon irremediably tends to occur spontaneously in all complex systems, natural or artificial, and that this fact should be taken into account by those who, like the author, seek to understand the causes of the growth of the system. currently prevailing society.

There would be much more to dig into the relativistic dunghill that phrases like the one indicated represent, but such a task would take us too far away from the practical purpose of this review, so for now we are going to leave it here.

Someone will object that what the author intended to say with that bullshit was merely that he is human and can be wrong. Okay, but it's one thing to say that he's fallible (which is a truism; Turiel is obviously not God, he doesn't need to remind us) and another to cheerfully blurt out that *he's not in possession of the true*. Only relativistic oafs can't tell the difference.

By the way, the myth is also frequently applied equally to science, and due to the already mentioned prevailing confusion between science and technology, it is often raised in reference to both indistinctly and simultaneously, both by its defenders and by many (too many) of his detractors.

[j] "Pristine wilderness" in the original. *N. from t.*

[1458][] "Tradeoff" in the original. It means that to get something you always have to pay a price. *N. from t.*

[1460][] is used by the author in the text. *N. from t.*

[m] "Iteration" in the original. It is probably a typographical error in the original text and Turner actually meant "interaction", so it has been translated as "interaction", not as "iteration" (see note rr of "Wildness and the preservation of nature" in Indomitable Nature: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-carcter-salvaje-y-la-defensa-de-la-naturaleza>][<http://www>

.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/el-carcter-salvaje-y-la-][[http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica /the-savage-character-and-the-defense-of-nature](http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/the-savage-character-and-the-defense-of-nature)][defense-of-nature)). *N. from t.*

[1461][n] “Wilderness areas” in original. *N. from t.*

[1462][“Wilderness” in the original. *N. from t.*

r ditto. N. from t.

[1463][**[1463]**] *ditto. N. from t.*

[<http://www.naturalezaindomita.com/resenas/una-tica-de-la-tierra>][<http://www.naturalezaindomita.com/resenas/una-tica-de-la-tierra>)). *N. from t.*

[1472]Rosling, *Factfulness*, Page 13.

[1489][(see, for example, Kaczynski, Theodore John, “Industrial Society and Its Future” ^ 145 [There is a Spanish translation: *La sociedad industrial y su futuro*, Isumatag, 2011: [<http://www.naturalezaindomita.com/publicaciones>][<http://www.naturalezaindomita.com/publicaciones>.] *N. del t.*)]. It is truly astonishing the faith that these fans of progress display in the midst of the multitude of crises caused by technology, both past and present: they urge readers to share with them their insane faith that the impending technologies to come will not bring us down. more problems infinitely, but will only solve those already recognized, but not yet solved.

[1490][Page 113.

[<https://www.reuters.com/article/idUSKCN1VJ25Z>][<https://www.reuters.com/article/idUSKCN1VJ25Z>;] Tavernise, Sebrina, “US Suicide Rate Surges to a 30-year High,” New York Times, April 22, 2016, online at:

<https://www.nytimes.com/2016/04/22/health/us-suicide-rates-surges-to-a-30-year-high.html>][<https://www.nytimes.com/2016/04/22/health/us-suicide-rates-surges-to-a-30-year-high.html>]

[1513][when he endorsed Nazism he could expect to be promoted within the Nazi hierarchy.” (page 81).

[https://aeon.co/essays/the-idea-of-primitive-communism-is-as-seductive-as-it-is-wrong?utm_source=Aeon+Newsletter&utm_medium=email&utm_campaign=launchnlbanner][https://aeon.co/essays/the-idea-of-primitive-communism-is-as-seductive-as-it-is-wrong?utm_source=Aeon+Newsletter&utm_medium=email&utm_campaign=launchnlbanner] . *N. from t.*

[1550][*The !Kung of Nyae Nyae*, Harvard University Press, 1976.

[1552][“The objective of a revolutionary movement, unlike that of a reformist movement, is not to gradually correct some of the problems of the social order. The goals of a revolutionary movement are:

[1553][a. Get stronger.

b. Increase the tensions within the social order until those tensions reach the breaking point.

Correcting this or that social problem is likely to reduce tensions within the social order. This is the reason for the classic antagonism between revolutionary movements and reformist movements.

Generally speaking, the correction of a given social problem serves the ends of a revolutionary movement only if:

(a) It constitutes a victory that enhances the prestige of the revolutionary movement.

(b) It represents a humiliating defeat for the existing social order.

(c) It is carried out by methods that, if not illegal, are at least offensive to the existing social order.

(d) It is widely perceived as a step towards the dissolution of the existing social order.

In the concrete situation that the world is facing today, there may also be another case in which a partial or gradual correction of a social problem may be useful: it may serve to buy us time. For example, if the progress of biotechnology slows down, a biological catastrophe will be less likely to occur before we have time to bring down the system.”

N. of the trad.

[1554]] Excerpt from the letter from Ted Kaczynski to David Skrbina dated 8-29-04 referred to here:

propagandists well know, reason alone is of little use in influencing the masses. [*Encyclopaedia Britannica*, 15[a] edition, 1997, Volume 26, article “Propaganda”, pages 175-76: ‘The propagandist must realize that neither rational arguments nor catchy slogans can, for themselves, accomplish much in influencing human behavior’]. To achieve a significant effect, it would be necessary to resort to the propaganda techniques of the system itself. An anti-establishment movement would perhaps discredit itself if it soiled its hands in this way.”

N. from trans.

[e] Excerpt from letter from Ted Kaczynski to David Skrbina dated 8-29-04 referred to here:

[1555]] “[I]t is highly unlikely that such a movement would ever have enough money to mount a worldwide, or even a national, effective campaign to persuade people [...] ‘The propaganda aimed at inducing great change surely involves the investment of a great deal of time, resources, patience and deception, except in times of revolutionary crisis, when the old beliefs have been overthrown...’. (*Encyclopaedia Britannica*, 15th edition, 1997, Volume 26, article “Propaganda”, page 176). The *Encyclopaedia Britannica*, *Macropaedia*, article

[1556]] See George Sessions’s review of this book and the articles “How Earth First Stopped Being First” by BR and “Where Is Earth First Going?” by Dave Foreman in *Indomitable Nature* [<http://www.naturalezaindomita.com/>][(www.naturalezaindomita.com)]. *N. of t.*

[1559]

Or something like that. This is probably from Ellul’s *Autopsy of Revolution*. In this case, and in any other letter I may write to you, please note that whenever I am unable to cite a source, giving the corresponding page number, for any data I mention

you may assume that I am basing myself on my (possibly mistaken) recollection of something I read (possibly many years ago), unless the data is something known to virtually everyone or can be found in readily available sources such as encyclopedias or ordinary textbooks. I know from experience that, in my case, this type of memory, although sometimes it may be completely wrong and sometimes it may be completely correct, is generally correct in broad strokes even if it fails in the details. **[There is a Spanish edition of the book by Ellul cited: *Autopsia de la Revolución*, Unión Editorial, 1973. N. from t.].**

[1560]

Neil J. Smelser, *Theory of Collective Behavior*, The Free Press (a division of the Macmillan Company), New York, 1971, page 349, note 5; quoting T. Abel, “The Pattern of a Successful Political Movement”, *American Sociological Review*, Volume 2 (1973), page 350. /em>, Economic Culture Fund, 1989. N. from t.].

[1565][...]. Social equality, however, was not always the case in all hunter-gatherer societies, despite what anarcho-primitivists say. [...].

[1589][https://en.wikipedia.org/wiki/Wilderness_Act][https://en.wikipedia.org/wiki/Wildemess_Act.]

[<https://vieja.patrimonionatural.org/noticias/general/2020/10/28/leon-acagera-un-centro-homologado-para-la-practica-de-mountain-bike-con-more-de-320-km-of-routes>][<https://vieja.patrimonionatural.org/noticias/general/2020/10/28/leon-acagera-un-centro-homologado-para->][<https://vieja.patrimonionatural.org/noticias/general/2020/10/28/leon-will-host-an-approved-centre-for-the-practice-of-mountain-bike-with-more-than-320-km-of-routes>][the-practice-of-mountain-bike-with-more-than-320-km-of-routes]

[<https://patrimonionatural.org/noticias/noticia/sale-a-licitacion-la-construccion-del-mirador-de-aldeadavila-un-nuevo-atractivo-en-arribes-duero>][<https://patrimonionatural.org/noticias/noticia/sale-a-licitacion-la-construccion-del-mirador-de->][<https://patrimonionatural.org/noticias/noticia/sale-a-licitacion-la-construccion-del-mirador-de-aldeadavila-a-new-attraction-in-arribes-duero>][aldeadavila-a-new-attraction-in-arribes-duero.].

The first news is about the creation of several hundred kilometers of bicycle routes from mountain bikes, in the heart of the Cantabrian Mountain Range, reopening tracks and roads that were being “lost”, ie, that were being recovered by wild Nature. Small mammals, amphibians, reptiles and invertebrates, for whom tracks and their slopes are often an impassable barrier, or who are often crushed to death by road traffic (and this includes bicycles), along with the habitat fragmentation or the erosion resulting from the creation and existence of tracks or roads, have been left in the background. Alto Bernesga is an area currently declared as “Special Conservation Zone” in the Natura 2000 Network and “Biosphere Reserve” (Fundación Siglo, 2018). The second news is about the construction of a new viewpoint, with a protruding elevated platform, a parking and a pedestrian path, in Arribes del Duero. It seems that, as there were “only” three viewpoints in the area, so it was necessary to build another one. The Arribes del

Duero is currently declared as “Natural Park” (Reyero, 2007) and “Biosphere Reserve” (Fundación Siglo, 2018).

[<http://www.eldiariocantabria.es/articulo/cantabria/total-105-lobos-han-sido-abatidos-2015-pasado-31-octubre-cantabria-autorizacion-gobierno-autonomico/20181107132636052852.html>][[www. eldiariocantabria.es/articulo/cantabria/total-105-lobos-han-sido-abatidos-2015-pasado-31-octubre-](http://www.eldiariocantabria.es/articulo/cantabria/total-105-lobos-han-sido-abatidos-2015-pasado-31-octubre-)][<http://www.eldiariocantabria.es/articulo/cantabria/total-105-lobos- have-been-killed-2015- past-31-october-cantabria-authorization-autonomous-government/20181107132636052852.html>][[cantabria-authorization-autonomous-government/20181107132636052852.html.](http://www.eldiariocantabria.es/articulo/cantabria/total-105-lobos- have-been-killed-2015- past-31-october-cantabria-authorization-autonomous-government/20181107132636052852.html)]

[1602][] “Self-willed land” in the original. The literal translation would be “land with its own will”. The expression

[1603][] “self-willed land” is frequently used by Anglophone conservation authors to refer,

[1604][] more or less metaphorically, to the wild, self-regulated, autonomous lands, that is, they follow their

[1605][] own dynamics and tendencies. *N. of t.*

[1606][] “US Geological Survey” in the original. *N. of t.*

[h] *Pinus ponderosa*. *N. of t.*

[j] “Juniperus” in the original. Common (and generic) name of several North American species of juniper or juniper that live in that region and usually grow associated with stone pines. *N. of t.*

[1608][] “Wilderness” in the original. *N. of t.*

[1610][] “Northern Intermountain West” in the original. *N. of t.*

[n] “Pacific Northwest” in the original. *N. of t.*

[1611][] “Wilderness deconstructionists” in original. *N. from t.*

[1612][p] “Old-timers” in the original. It is an expression that generally refers to the people of yesteryear and, depending on the context, can refer to the elderly and veterans of today or to people of past times. Here it has been translated as “ the old settlers”. *N. from t.*

[1613][] Foreman lives in New Mexico, in the Southwestern United States. *N. from t.*

[1614][] Probably *Picea pungens*. *N. from t.*

[1615][] The doctrine of Manifest Destiny is a theory that expresses the belief that the United States of

[1616][] America is a nation destined (by God) to expand from the coasts of the Atlantic to the Pacific. This doctrine had a great impact in the 19th century, since it served, in part, as an excuse for the

[1617][] conquest of the West and the advance of the border between the wild and the civilized, always at the expense of the wild territories. *N. from t.*

[1618][] “Wilderness deconstructionists” in the original. *N. from t.*

[u] “Once touched by humans in any way, wilderness has evaporated” in the original. *N. from t.*

[1620]] *N. from t.*

[1621]] Foreman has a bad habit of selling the skin of the bear before hunting it, that is, of referring to books of his that have not yet been published at the time he writes the articles in which he mentions them. Some

[1622]] of them, like the one quoted here, remain unpublished several years after being mentioned.

[1623]] *N. from t.*

[and] “Endangered Species Act” in the original. American law that regulates the protection and recovery of certain species. *N. from t.*

[z] In ecology, resilience is called the ability of an ecosystem to recover from disturbances. *N. from t.*

[aa] “Rewilding” in the original. It refers to the recovery of the wild character. *N. from t.*

[bb] “Wilderness idea” in the original. *N. from t.*

[cc] “National Wilderness Preservation System” in original. *N. from t.*

[dd] “Wilderness area protection” in the original. *N. from t.*

[ee] “Wilderness area idea” in the original. *N. from t.*

[ff] “Wilderness areas protection” in the original. *N. from t.*

[gg] “Wilderness” in the original. *N. from t.*

[1625]] “Wilderness Act” in the original. *N. from t.*

[ii] “Anti-wilderness” in the original. *N. from t.*

[jj] 1 acre is equal to about 0.4 hectares. *N. from t.*

[kk] “Wilderness areas” in the original. *N. from t.*

[mm] Apostle Islands National Lakeshore Gaylord Nelson Wilderness Area” in original nn “...comes from post-designation management rules” in original. *N. of t.*

[oo] See footnote w. *N. from t.*

[pp] “Wilderness areas” in the original. *N. from t.*

[qq] Free translation of the original expression “I hope I have beaten up on this dead horse enough so that no one will try to get it back up on its feet!”. The literal translation would be: “I hope I have whipped this dead horse enough so that no one will try to get him back on his feet!”. Here Foreman refers to an English saying: “To beat up on a dead horse” (“Whip a dead horse”) which comes to mean the same as the Spanish saying: “Machacar en hierro fría”, that is, keep doing something that doesn’t make sense, that is a waste of time, or that no longer gives of itself. A less literal translation has been chosen but one that sounds more natural to the ears of a Spanish speaker. *N. from t.*

[rr] “Wilderness” in the original. *N. from t.*

[<https://www.naturalezaindomita.com>][<https://www.naturalezaindomita.com>] / textos/naturaleza-salvaje-y-teora-ecocntrica/las-tierras-salvajes-de-la-historia

[tt] There is a translation in Spanish: “Wild areas, today more than ever”, in Indomitable Nature: [<http://www.naturalezaindomita.com/crtica-y-alternativa-a-la-idea-de-las-zonas-wild-wild-zones-today-more-than-ever-wild-today-more-than-ever>]

[1628]] “Wild, Wild East” in the original. *N. from t.*

[ww] “Campaign for America’s Wilderness” in the original. *N. from t.*

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/contr-la-construccin-social-de-la-naturaleza>][(<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-v-teora-ecocntrica/contr-la-construccin-social-de-la->)] [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/contr-la-social-construction-of-nature>][nature)], “The Real Idea of Wild Nature” by Dave Foreman

[<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-autntica-idea-de-la-naturaleza-salvaje>][(<http://www.naturalezaindomita.com/textos/wild-nature-v-ecocentric-theory/la-authentic-idea-de-la-naturaleza>)] [<http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/la-authentic-idea-of-wild-nature>][wild)] or “Is nature real?” by Gary Snyder [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/es-la-naturaleza-salvaje-algo-real>][(<http://www.naturalezaindomita.com/texto/naturaleza-salvaje>)] [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/es-la-naturaleza-salvaje-algo-real>][v-teora-ecocntrica/es-the-wild-nature-something-real)].

[1647]“Wilderness” in the original. *N. of the t.*

“ [I want to draw] the reader’s attention to what I wrote in “Hit Where It Hurts” [“Hit Where It Hurts”, published in *Texts by Ted Kaczynski*, UR (Ed.), 2005] about of breaking the windows of McDonald’s or Starbuck’s and pointing out that the same is applicable to robberies, etc., which are nothing more than pricks without any significance, so they are not true revolutionary acts”. (Excerpt from a letter from Ted Kaczynski to UR dated 6-5-2005. Original in Spanish). (*T.N.*).

“ Maybe ten or fifteen years ago - I don’t remember exactly - some groups called themselves ‘militia’ arose, for example, ‘Montana Militia’, or ‘militia’ from this or that state. They armed themselves as far as they could legally, and it is likely that they secretly acquired some illegal weapons as well. They wanted to rebel against the unfreedom of modernity (unaware of the link between unfreedom and modern technology), but their ideas were utterly naive: They clung to the United States Constitution, which, according to their naive interpretation, it guaranteed them such and such rights and freedoms. They believed there was a conspiracy to have the United Nations seize power in the United States. According to those militiamen, there were United Nations troops hiding somewhere in the United States and waiting to take over. The militiamen intended to confront them. Timothy McVeigh, who blew up the Federal Building in Oklahoma City, had some kind of ties to the militias, a fact that the media used to discredit the militias. This worsened their fame so much that the movement almost died. The militias still exist today, but they have few followers. (Excerpt from a letter from Ted Kaczynski to UR dated 9-7-2005. Original in Spanish). (*N. del T.*).

[https://hrcak.srce.hr/index.php?show=toc&id_broj=4048][https://hrcak.srce.hr/index.php?show=toc&id_broj=4048.] Translator’s note.

[1680]]enthusiastic commitment to nuclear energy. But the claim that the use of nuclear energy does not contribute to the increase in greenhouse gases is accurate only if one looks just at the processes that take place in nuclear reactors; otherwise is completely wrong. All major phases in energy production from ore mining and processing to the building of nuclear power plants, to transport, to construction of reactors and transmission lines, etc. require huge quantities of fossil fuels. Wastes, high costs, security issues or the proliferation of nuclear weapons are just some of the huge problems with the recent renewal of enthusiasm around the nuclear industry. The end of the era of cheap energy excludes the possibility of renewing the mass construction of reactors, as it happened from the 1950s until mid-1970s. Like other quasi-alternatives, nuclear energy is a derivative of fossils fuel.

[<https://vahsikaracam.blogspot.com/2021/05/brave-new-world-1984-and-techno.html>][<https://vahsikaracam.blogspot.com/2021/05/brave-new-world-1984-and-techno.html>] *N. from t.*

[<https://vahsikaracam.blogspot.com/2020/12/solculuk-tekno-endustriyel-sistem-ve.html>][(<https://vahsikaracam.blogspot.com/2020/12/solculuk-tekno-endustriyel-sistem-ve.html>)] [There is a Spanish translation: “Izquierdismo, techno-industrial system and Wild Nature” in Indomitable Nature [<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-sistema-technoindustrial/leftism-system-technoindustrial-and-wild-nature>]](<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del->)[<https://www.naturalezaindomita.com/textos/critique-of-civilization-and-the-techno-industrial-system/leftism-techno-industrial-system-and-wild-nature>]] [techno-industrial-system/leftism-techno-industrial-system-and-wild-nature)]. *N. del t.*] and Último Reducto, “Leftism: function of pseudo-criticism and pseudo-revolution in techno-industrial society” [<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-techno-industrial-system/leftism>]](<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del->]

[<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-sistema-tecnoindustrial/izquierdismo>]] [sistema-tecnoindustrial/izquierdismo)].

[<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-autntica-idea-de-la-naturaleza-salvaje>]] [autentica-idea-de-la-naturaleza-salvaj e .] *N. from t.*

N. from t.

[1778]] “Naturalness” in the original. *N. from t.*

[j] “Rewilding” in the original. The English term “rewilding” refers to the recovery of the wild character. In this text it has been literally translated as “rewilding”. *N. from t.*

[k] “Naturalness” in the original. *N. from t.*

[l] *Idem. N. from t.*

[1780]] “Wilderness areas” in the original. In this text, unless otherwise indicated, it will be translated as “wild areas” or “wild areas”. *N. from t.*

[j] Fishes of the billfish family. *N. from t.*

- [1782] “Wild Earth” in the original. *N. from t.*
- [m] “Wilderness regions” in the original. *N. from t.*
- [n] *Idem.* *N. from t.*
- [or] “1964 US Wilderness Act” in the original. *N. from t.*
- [p] “Wilderness areas” in the original. *N. from t.*
- [1784] “UN Framework Convention on Climate Change (UNFCCC)” in the original. *N. from t.*
- [r] “Wilderness areas” in the original. *N. from t.*
- [t] “Intra-governmental organizations” in the original. Surely it is an error and the authors referred to “inter-governmental organizations”, that is, to international or inter-governmental organizations, since the example they cite, the IUCN, is an organization of this type. It has been corrected in the translation. *N. from t.*
- [u] “International Union for Conservation of Nature (IUCN)” in original. *N. from t.*
- [v] “Wilderness” in the original. *N. from t.*
- [w] “Global Environment Facility” in the original. *N. from t.*
- [x] “Natural World Heritage Sites” in the original. *N. from t.*
- [and] “UN World Heritage Convention” in the original. *N. from t.*
- [1786] “Wilderness” in the original. *N. from t.*
- [aa] *ditto.* *N. from t.*
- [bb] “United Nations Convention on the Law of the Sea”. *N. from t.*
- [1787] “Antarctic Treaty System’s Committee for Environmental Protection” in original. *N. from t.*
- [1788] “International Finance Corporation” in the original. *N. from t.*
- [1789] [ee] “Regional fisheries management organizations (RFMOs)” in original. *N. from t.*
- [ff] “North East Atlantic Fisheries Commission” in the original. *N. from t.*
- [gg] “Wild places” in the original. *N. from t.*
- [xl] Howie Wolke, American conservationist and co-founder of Earth First! *N. from trans.*
- [xli] —Juniper chaining” in the original. It refers to a tree felling technique in which two motorized vehicles drag a chain felling all the trees and bushes that get in their way. *N. from trans.*
- [xlil] *Oncorhynchus gilae.* *N. from trans.*
- [1829] [part two titled *The Wilderness Debate Rages On: Continuing the Great New Wilderness Debate*, University of Georgia Press, 2008. *N. from trans.*
- xlvi —Self-Willed Land” in the original; Perhaps a more appropriate translation to the context would be —Autonomous Land” but, given the puns that the author makes with this term in the text, the translator has considered that the best translation, in this case, is the literal one: —Land with Own Will”. *N. from trans.*
- [xlx] —Bud Man on his motorized tricycle” in the original. Here it has been loosely translated as “beer biker.” The original expression refers to Bud Man, a cartoonish (chubby, beer-loving) superhero who is the mascot of Budweisser beer. Perhaps the

author is referring ironically to the fans of off-road "quads" who defend that their "hobby" is a "sport" that allows contact with Nature, even when they do not even get out of their vehicles and these damage the ecosystems in its wake. *N. from trans.*

[liii] As the author has commented elsewhere (for example, in the interview with Jeremy Lloyd, —Redneck for Wilderness: Earth First! co-founder Dave Foreman on being a true conservative", published in *The Sun*, December 15, 2005), he believes that the term —wilderness" is related to the Old Germanic word —wildeor" and that it referred to the place inhabited by wild animals (in Old English —wilde" was —wild, not domesticated, uncontrolled" and —deor" was —wild animal", in general, and —cervo" —"deer" in current English—, in particular). *N. of the trad.*

[liv] —Wilderness areas" in the original. *N. from trans.*

[lv] "Wildemess" in the original. In this case I have translated it as —wild territories". *N. from trans.*

[lvi] —National Wilderness Preservation System" in the original. *N. from trans.*

[lvii] The doctrine of Manifest Destiny is a theory that expresses the belief that the United States of America is a nation destined (by God) to expand from the coasts of the Atlantic to the Pacific. This doctrine had a great impact in the 19th century, since it served, in part, as an excuse for the conquest of the West and the advance of the Frontier between the wild and the civilized, always at the expense of the wild territories. *N. from trans.*

[lviii] Calvinism is a Protestant theological system. What mainly differentiates it from other Protestant sects is the fatalism or belief in predestination. In turn, dualism is called the doctrine that affirms the existence of two opposing supreme principles, one of good and the other of evil, by whose action the origin and evolution of the world is explained. With dualistic Calvinism, the author wants to highlight the widespread belief in the 19th century, also expressed by Manifest Destiny, that it was the hand of God that guided and predestined the domination of the wild territories of the United States and that said conquest it was the fight between good and evil where good was the civilization guided by God, and evil was materialized in the "dark" wild territories, full of beasts and Indians. *N. from trans.*

[lix] Postmodern enemies of the idea of Wilderness often claim that Wilderness is heavily influenced by the ideas of "Manifest Destiny", "Calvinism" and "Dualism". Hence, Foreman refers to these concepts here. *N. from trans.*

[lx] —Wilderness" in the original. In this case I have translated it as —wild territories". *N. from trans.*

[1833][lxi] "Untrammeled" in the original. *N. from trans.*

[1x11] —A *trammel* is a fish net and also a hobble for a horse, thus a thing that hinders free action", in the original. It is impossible to literally translate this phrase into Spanish without at least part of it being incomprehensible and out of context (literally: —A *trammel net* is a fishing net and also a horse's cloak, therefore, something that hinders free action"). The author plays in English with several of the meanings of the term —trammel" (trammel or impediment, but also trammel —a type of fishing

net— and maniota —an artifact that ties the front legs of horses like —handcuffs” and prevents them from trotting, galloping or even walking easily-). The usual translation into Spanish of —trammel” would be —traba” and, although one of the meanings of —traba” is also Maniot, there is no meaning of —traba” in Spanish that refers to a trammel net, so it has been opted to remove the reference to the fishing net from the translation. *N. from trans.*

[lxiii] More exactly 2023.43 hectares (5000 acres in the original). *N. from trans.*

[1834][lxviu —Wilderness” in the original. In this case I have translated it as “wild territory”. *N. from trans.*

lxix “Wilderness areas” in the original. *N. from trans.*

[lxx] —Wilderness” in the original. I have considered that the best translation is —the wild”. *N. from trans.*

[lxxi] Article in which Michael Soulé and Reed Noss analyze the main differences between the two main tendencies within North American conservationism and define the term —rewilding”. See the bibliography. *N. from trans.*

[lxxii] Michael Soulé is an American biologist and conservationist known, above all, for being one of the pioneers of the so-called “conservation biology”. *N. from trans.*

[lxxiii] Reed Noss is a professor and researcher on ecosystem conservation, management and restoration. *N. from trans.*

[lxxiv] —Connectivity” in the original; refers to the interconnection of natural areas, through ecological corridors to counteract the fragmentation of ecosystems. *N. from trans.*

[lxxv] —Rewilding” in the original. Literally “rewilding”, it refers to the recovery of wild areas that have suffered different degrees of degradation. In this text I have translated it as —restoration of wild areas”. *N. of the trad.*

[lxxvi] —Resourcism” in the original. Foreman uses this term to refer to the efficient exploitation and prudent management of natural resources aimed at sustainable use of such resources by humans. *N. of the trad.*

[1836][*Revolution: Why and How*, Fitch & Madison, 2016, Appendix Three, pgs. 209-214. © Copyright Theodore John

[1837][Kaczynski, for English original. © Copyright Anónimos con Cautela, 2017, for the Spanish translation. *Note*

[1838][*from the translator.*

THE LONG-TERM CONSEQUENCES OF GEEENGINEERING

By Theodore John Kaczynski[a]

In 2009, a person wrote to me asking if I thought nuclear weapons were the most dangerous aspect of modern technology. What follows is my answer, quite modified.

The most dangerous aspect of modern technology is probably not nuclear weapons. One could reasonably argue that the most dangerous aspect of modern technology is the remedies that are most likely to be adopted to counteract climate change.

Nations have a strong incentive to avoid using nuclear weapons, at least on a large scale, since such use would likely be suicidal. This does not mean that nuclear war can never happen. On the contrary, the risk of its happening is very real. But, at least in the near future, a major nuclear war is not very likely.

On the other hand, it is virtually certain that countries will fail to reduce their carbon dioxide emissions in time and enough to prevent global warming from becoming disastrous. Instead, global warming will be kept in check through so-called "geoengineering." This means that the Earth's climate will be artificially managed to keep it within acceptable limits.¹ Of the many tools that have been proposed for managing the Earth's climate, three examples can be cited here: (i) Powdered iron can be dumped into the oceans in order to stimulate the growth of plankton, which will absorb carbon dioxide of carbon from the atmosphere.² (ii) Microbes or other genetically modified organisms can be created that consume atmospheric carbon dioxide.³ (iii) Carbon dioxide can be pumped into underground reservoirs to keep it stored there permanently.⁴

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

Any attempt to apply geoengineering will carry a serious risk of immediate catastrophe. “Geoengineering makes the ballistic missile defense problem look simple. It has to work accurately the first time.”⁵ New technological solutions usually have to be corrected repeatedly through a process of trial and error; they seldom work “right the first time,” and this is why people “quite rightly see [geoengineering] as something to fear.”⁶

But even assuming that geoengineering works accurately the first time, there is reason to believe that the long-term consequences will be catastrophic.

First: attempts to interfere with the environment almost always have unintended consequences. In order to correct undesirable consequences, further interference with the environment is required. This, in turn, causes other unintended consequences... and so on. Try to solve our problems by

[a] Translation by Último Reducto of “The Long-Term Outcome of Geo-Engineering” published as the fourth appendix in the book *Anti-Tech Revolution: Why and How* by Ted Kaczynski, Fitch & Madison, 2015. © 2015 Theodore John Kaczynski for original text. © 2017 Último Reducto for the Spanish translation. *Translator’s note.* manipulation of the environment will only cause us to sink deeper and deeper into these problems.

Second: For hundreds of millions of years, natural processes have kept the Earth’s climate and the composition of its atmosphere within limits that allowed complex life forms to survive and evolve. At various times during this period, the climate has varied enough to cause the extinction of numerous species, but it has never become so extreme as to eliminate all the more complex organisms.

When humans have taken over the management of the Earth’s climate, the natural processes that have kept the climate within acceptable limits for life will lose their ability to perform that function. The climate will be completely dependent on human management. Since Earth’s climate is a global phenomenon, it cannot be managed by independent local groups; its management will have to be organized on an international basis and, therefore, rapid global communication will be required. For this reason, among others, the management of the Earth’s climate will be dependent on technological civilization. All the civilizations of the past have ended up collapsing and, in the same way, the modern technological civilization will end up collapsing sooner or later. When that happens, the human-dependent climate management system will inevitably collapse as well. Since the natural processes that have so far kept Earth’s climate in check will no longer be at work, expect Earth’s climate to go haywire. In all likelihood the Earth will get too hot or too cold for complex life forms to survive, or the percentage of oxygen in the atmosphere will drop too low, or the atmosphere will become polluted with toxic gases, or some other atmospheric disaster will occur.

⁵ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

Third: when the Earth has a managed climate, the maintenance of the technological system will be considered essential for survival since, as I have already pointed out, the collapse of the technological system is likely to lead to a radical and fatal climatic disturbance. The elimination of the technological system, by revolution or by any other means, would be almost tantamount to suicide. Since the system would be seen as indispensable for survival, it will be virtually immune from challenge.

The elite of our society - scientists and engineers, corporate managers, government officials and politicians - fear nuclear war because it would mean their own destruction. But she would be delighted to see the system that gives her her power and status become indispensable and therefore immune to any serious challenge. Consequently, it will do whatever it takes to avoid nuclear war, but it will be very happy to manage the Earth's climate.

Grades:

1. See, for example, *Time*, March 24, 2008, page 50.

2. Wood, p. 73, coll. two.

3. Leslie, p. 6. cabbage 4 (microbes). Wood, p. 73, coll. 1 (trees).

4. Wood, p. 73, coll. 2. Sarewitz & Pielke, p. 59, col. 3. The question of whether carbon dioxide will remain buried as long as the proponents of this plan believe remains unanswered. Even if a "demonstration project" (*ibid.*) managed to keep CO₂ in the ground for, say, ten years, that would not guarantee that it would stay there for a hundred or a thousand years. In addition, any demonstration project will be carried out in a particularly careful way by highly qualified experts. However, once the procedure becomes routine and widely applied, negligence and dishonesty will *inevitably* occur in its execution. Compare Kaczynski, pp. 315, 417-418.

5. Wood, p. 76, col. 1, citing Raymond Pierrehumbert, a geophysicist at the University of Chicago.

6. *Ibid.*

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PRESENTATION OF “POPULATION, AFFORDANCE OR TECHNOLOGY?”

The article that we present below is the translation of a chapter of a book written by two American authors, Foreman and Carroll. Their interest for us lies mainly in two issues: On the one hand, at least in the case of Foreman, they are people who take as a reference in their work the respect and devotion to wild Nature, something common to a certain extent in the culture North American but almost non-existent in Spanish culture and thought.

On the other hand, this text is a good example of how some people can go well beyond the usual environmental slogans of sustainability, recycling, renewable energy, etc. to which we are becoming more and more accustomed. The authors have taken into account other factors ignored by most, such as population growth, and how this has been favored throughout history by technological development.

Furthermore, it is not a warning to avoid a possible collapse of industrial civilization (as in fact it happened with the scientists Holdren and Erlich, mentioned in the text and known for their theories about population growth). On the contrary, this analysis of the impact of the demographic growth of human societies on the environment is clearly motivated by a genuine concern for the effects that this impact is generating on wild Nature. In short, it is ecocentric rather than anthropocentric thinking. Something, apparently, difficult to understand for a humanity incapable, for the most part, of seeing beyond its own navel.

Even so, leaving aside all these, for us, virtues, the reality is that the way in which Foreman and Carroll understand the functioning of techno-industrial society and the strategy to defend wild Nature can be questioned in several aspects. We will mention, in our opinion, the most important:

- The $I=PAT$ equation is more of a “pedagogical” tool, that is, a useful graphic expression to publicize and highlight the existing interaction between population, opulence and technology when it comes to generating impacts on the biosphere, which of a correct and adequate mathematical model that faithfully represents these complex interrelationships.

Thus, for example, often (even in this text, albeit punctually and obliquely) technological development is mentioned, not as a factor that increases impact, but quite

the opposite, as something that reduces it. Advanced technologies are supposed to be more efficient in using resources and this would, in principle, reduce the impact on Nature. However, in such a case, T should be a denominator: $I=PA/T$.

On the other hand, the three variables have different degrees of mutual independence/dependence. Thus, for example, technology sometimes acts as an independent variable, as in the case cited by the authors in which T increases the carrying capacity, affecting the other two variables. But other times, at least to some extent, T acts as a dependent variable of P and/or A. For example, a minimum population and/or wealth is needed to reach and maintain certain levels of technological development; a completely isolated group of, say, a hundred people with limited material resources cannot create, use, or maintain modern industrial technology; this requires masses of millions of people and many resources.

How would all these nuances be included in a valid mathematical model? We don't know, but it certainly wouldn't be with a formula as simple as $I=PAT$.

- The problem of technology is not treated adequately in this article. The impact of technology on Wilderness is not only due to the indirect impact through increased carrying capacity discussed by the authors, but technology also has a direct impact on Wilderness. Technology neither comes out of nowhere nor disappears into nothing, that is, to manufacture it, use it, and even to dispose of it, natural resources are needed: matter, energy and space, which can only be obtained at the cost of destroying and subjugating the Wild nature. And, curiously, this, which is the most obvious and unavoidable impact of technology, is overlooked by the authors of the text (and, with them, by much of humanity).

In addition, technological development also inevitably entails other impacts and threats to the wild, perhaps less obvious but no less serious, such as, to cite just a few examples, the hybridization of humans with technological devices, biotechnology, geoengineering or ecological disasters resulting from human negligence or technical errors.

In short, while the authors readily acknowledge that population and affluence have direct impacts on Wilderness, they overlook the more direct and obvious impacts of technology and only acknowledge the indirect impact of technology by increasing the population and, with it, consumption by increasing the carrying capacity. For them, in reality, no matter how much they say in the title and in the first paragraph, the equation $I=PAT$ would be practically reduced to $I=PA$. This blatant underestimation of the real impact of technology in their interpretation of the $I=PAT$ equation suggests that, unfortunately, the authors consider technological development to be an inevitable and unstoppable (if not even desirable) fact that they do not care about. can affect.

- Despite the fact that up to now demographic growth has gone hand in hand with technological development, this relationship does not have to continue to be direct in the near future. The fact that technological progress has so far favored population growth and thus the ecological impact, does not mean that less demography will translate into less ecological impact. If technological development continues, there is

nothing to suggest that the hoarding of natural resources and the degradation and domination of ecosystems will cease or even decrease, even if population growth or personal consumption slow down or even reverse to a certain extent. *capita*. It is more than doubtful that replacing humans with robots, computers, drones and other machines will improve the state of the wild and natural world. Let's remember what was said above, technology, like any other physical system, inevitably needs to consume energy, matter and space to exist and function.

- A possible proof that the mere fact of curbing population growth and affluence will not improve the state of Wild Nature is the phenomenon mentioned in this article under the name of "Jevons paradox". Indeed, saving resources per inhabitant is of little use if demographics continue to grow. But precisely for this reason (and this is where the authors of the text make a major mistake), the apparent saving of resources resulting from the stabilization or decrease of demographics, would serve only for those resources to be invested in promoting technological development even more, increasing finally the ecological impact at a global level. So feeling contradicting the authors of the text, the decrease in human numbers on the planet will not serve by itself to escape the Jevons paradox... unless it is also accompanied by a setback in the technological level, since that, let's not forget, technology is also a multiplier in the $I=PAT$ equation.

- In relation to the above, it is shocking that the authors say that we need to carry out, as far as we can, the voluntary changes in lifestyle that they list in the text (use the car less, eat at a lower level in the food chain or living in smaller, more energy efficient houses) as ways to reduce the impact due to affluence. Doesn't Jevons' paradox also hold in such cases? Will not the energy and resources saved with these or other "green" changes in the way of life of some individuals remain available to be consumed by other less "eco-scrupulous" individuals in any other part of the techno-industrial system, thus maintaining its growth? Who really benefits from these voluntary and minority "green" changes in lifestyles and the resource savings that they are supposed to bring? Wild Nature or the techno-industrial system? What part of the text are we to take seriously? The sections dedicated to the "ecological footprint" and the carbon legacy or the one dedicated to the Jevons paradox?

POPULATION, AFFECTION OR TECHNOLOGY?

By Dave Foreman and Laura Carroll¹

Take, for example, a hypothetical American woman who upgrades to a more fuel-efficient car, drives less, recycles, installs more efficient light bulbs, and replaces her

¹ Translation by Último Reducto of "Population or Affluence -or Technology?", chapter 10 of the book *Man Swarm: How Overpopulation is killing the Wild World*, 2[a] Edition, Live True Books, 2014. © 2014 Dave Foreman and Laura Carroll. *N. from t.*

fridge and windows with energy-saving models. Researchers have found that if you have two children, your carbon footprint will end up being almost forty times greater than what you have avoided by doing so.²

The New York Times

Do you remember the scientific formula of John Holdren and Paul Erlich, (I) Impact = (P) Population x (A)³ [Affluence (resource consumption)] x (T) Technology, or I=PAT? There are those who believe that decreasing Opulence is the way to live within carrying capacity⁴ and to reduce our Impact. Others believe that Technology can do much of the miracle of keeping Impact low while we grow in Opulence and Population. They believe that Technology can increase Opulence and reduce Impact, so we don't need to take Population into account. Is technology the answer to our problems? Let's take a closer look at the matter.

How Technology Influences Impact

In *Constant Battles*, archaeologist Steven LeBlanc shows us how Technology works in the I=PAT equation.⁵ Technology can increase carrying capacity, allowing both Population and Opulence to grow. If we stop to think about it, this is the true saga of Man, not only throughout the last fifty thousand or more years of the existence of *Homo sapiens*, but even much earlier, with the previous *Homos*, as LeBlanc excellently demonstrates in *Constant Battles*. Although the Technology can extend the load capacity it does not soften the Impact. It increases it. Again, this is the true story of Man. A technological step "forward" increases our cargo capacity. Then Population and Opulence grow until they run into the new carrying capacity. Bad things happen until a new advance appears in Technology, which again increases the carrying capacity. And so on. However, a higher carrying capacity for Man means that we have a greater Impact on wild beings.

This cycle has been going on since before we were *Homo sapiens*, at least since *Homo heidelbergensis*, the ancestors of both Neanderthals and ourselves. It could even go back to *Homo erectus* or *ergaster*. Let's see how *could* have happened.

For a long time, the size of our ancestors' populations was kept small by predation. We were cat food. Probably a very easy cat food to catch. As our ability to throw stones, carve pebbles, and later wield wooden spears and command fire improved, we gradually became more difficult prey and our population grew. When *Homo sapiens*, like the Cro-Magnons, arrived in Europe, their best tool kit, which enabled them to be

² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

³ From the English "Affluence" ("Opulence"). *N. from t.*

⁴ In ecology, the carrying or carrying capacity of an ecosystem for a given species is the maximum number of individuals of that species that the ecosystem can support. *N. from t.*

⁵ Original title: *The Vanishing face of Gaia.*

better hunters of large prey, increased their carrying capacity above what Neanderthals probably had. Better social organization, microliths, sewing needles, hooks, propellers, bows and arrows, the inclusion of dogs in bands and other steps "forward" in hunter-gatherers made the cycle take another turn. Technological advances increased carrying capacity, increased Population and Opulence, and had a greater Impact on wildlife.

The cycle jumped to a new, much higher level with settled life, grain storage, weaving, pottery, and the domestication of wheat, beans, goats, sheep, pigs, and cattle. Renowned paleoanthropologist Niles Eldredge of the American Museum of Natural History writes, "The impressive growth in population following the invention of agriculture can only mean one thing, that the primitive limits to ... growth were removed. It's not that we just got better at getting sustenance from ecosystems: we actually stopped doing that... to go into farming."⁶ Then came copper, bronze and iron, irrigation, the wheel and cities.

If I may mess with Ehrlich and Holdren's equation, this true saga of Man happened like this: More Advanced Technology = Greater Carrying Capacity = Higher Population and Opulence = Greater Impact on Wild Beings: $HT = HCC = HP + HA = HI$.⁷

Almost everyone, including members of the population stabilization movement, seems to see the problem of population growth only as a modern problem or, at best, as a problem that arose with the rise of the first states. In *Constant Battles* Steven LeBlanc and his wife, Katherine Register, debunk that myth of the Noble Savage. In this book, LeBlanc uses evidence from primatology, biological anthropology, paleoanthropology, archaeology, history, and ethnology to show that endless bloodshed and warfare, both between and within human groups, they come from the fact of exceeding the carrying capacity as a result of population growth.⁸

There have never been human groups that have lived in ecological harmony with their environment or that have been sustainable for a long time. As their size grew, they overharvested the land and wild resources around them, leading to devastation of their habitat and increasing the likelihood of famine and starvation. When this happened, resource struggles with neighbors began and wars lasting many years were waged over competition for scarce resources.

At each rung of the ladder of growing cultural complexity, new technologies increased the carrying capacity of the land (and sea), leading to larger populations and deeper ecological damage. Since the appearance of behaviorally modern Man some fifty thousand years ago and our spread throughout the rest of the world beyond Africa, this has been our story. No matter how cultures "progress" through the differ-

⁶ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁷ Where:

⁸ In this regard, see the translation into Spanish of chapter 3 of *Constant Battles*, "Enter a conflict," in *Naturaleza indómita* ([<http://www.naturalezaindomita.com/textos/enter-in-conflict>][<http://www.naturalezaindomita.com/textos/entrar-en-conflicto>]). *N. from t.*

ent stages, from hunter-gatherer bands to modern states, via tribes, chiefdoms, and kingdoms, even as technological advances at each step increase carrying capacity, we continue to surpassing it. We have now reached the end of that road. There are so many people gobbling up so much that our waste carbon dioxide, methane, soot and other greenhouse gases are changing the composition of the atmosphere and thus disrupting the climate and acidifying the seas, which kills coral reefs and other ocean life. With seven billion people and growing, we have exceeded the carrying capacity of the atmosphere and the oceans to absorb and maintain our waste at a safe level.

Again, we may have reached the end of the cycle. A disaster - greater than all previous cycles - threatens us.

The ecological footprint

Among the people working to lessen the Impact, there has long been a divide between those who think we need to stabilize, and then reduce, Population and those who think we need to reduce waste (Affluence). The truth is that we need to stop and reduce *both*, Population and Opulence. Reducing Opulence cannot work without decreasing Population.

There is an ingenious way of framing the Impact that we have called the individual "Ecological Footprint". However, it has the same limitations and weaknesses as carrying capacity in that it only measures our Impact on the Earth's resources that serve to sustain Man in the way of life to which we have become accustomed.⁹ In *From Big to Bigger*, a great report on mass immigration and the Ecological Footprint, Leon Kolankiewicz defines the latter as follows:

The Ecological Footprint is a measure of the sum of human demands, or human burdens, placed on the biosphere or "ecosphere". In the end, the human economy, all the production and consumption of goods and services, depends entirely on the Earth's natural capital - arable land, forests, crop fields, pastures, fishing grounds, water and clean air, atmosphere, ozone layer, fossil fuels and minerals - that performs ecological services and provides the materials and energy "sources" and waste "sinks" that sustain civilization.< /em>¹⁰

Those who see Opulence/consumption as the key use the Ecological Footprint as a criteria to reduce their Impact through lifestyle changes. These changes include:

- Drive less/buy a car that consumes less/use the bus, bike or walk.

⁹ The authors, in chapter 3 of the book from which this text originates, criticize that the classic definition of carrying capacity for the human species refers only to the maximum human population that an ecosystem can maintain, without take into account the damage to other species or to the ecosystem itself that can and often does lead to the maintenance of that human population. This is what the authors refer to with the limitations and weaknesses of the concept of carrying capacity. *N. from t.*

¹⁰ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

- Buy food grown locally/eat organic food/grow your own food/eat lower in the food chain.
- Renovate your house to be more energy efficient/live in a smaller house/share housing.

All the steps above and others like them are good. We need to carry them out, at least some of them, to the extent that we can. Americans can reduce their footprints by cutting back, but as philosophy professor Philip Cafaro and Colorado state wildlife biologist Winthrop Staples point out in their landmark article, “The Environmental Argument for Reducing Immigration to the US”, Americans are not going to stop consuming too many things. The Japanese and Western Europeans live well but are comparatively more energy efficient and have smaller footprints than Americans and Australians. Cafaro and Staples say we should reduce our consumption to the level of the Japanese and Europeans, but “barring universal enlightenment or a terrible catastrophe,” cut it to the standard of living of the Mexicans or - good grief! - of the Nigerians or the Bengalis, “are not viable *political* options”.¹¹ In other words, we can reduce our footprint per person, but not enough for *generous sustainability*, which Cafaro and Staples define as “(1) creating societies that leave enough natural resources for human generations of the future live good lives; and (2) sharing the landscape generously with non-human beings.”¹²

It follows that we have no choice but to stabilize and reduce our numbers. Otherwise, we will lose more and more types of other living things in our landscapes. Anyone who believes that we can double or triple the population of the United States without wiping out our flora and fauna or wiping out our last remaining wilderness is in the clouds, not in the real world where we have to share our neighborhood with other creatures if we want to keep them safe and sound.

Here is some good research and analysis that clearly shows that to reduce our footprint we have to reduce our population.

Expansion

In the US, urban and suburban sprawl tramples and kills wildlife in a big way. For example, in the twenty years between 1970 and 1990 in the one hundred largest urban centers in the US, more than nine million acres¹³ of wild or farmland were lost to sprawl. In their study, *Weighing Sprawl Factors in Large US Cities*, Leon Kolankiewicz and Roy Beck take a detailed look at the 100 largest US cities to discover whether the key cause of the expansion of each was population growth, or rather the tendency to build larger houses and gardens. Popular belief holds that it is high living standards that

¹¹ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

¹² A couple of examples:

¹³ Surface measure that is equivalent to about 0.4 hectares. *N. from t.*

promote expansion and that population growth plays only a small role. However, this was not what Beck and Kolankiewicz discovered.

Kolankiewicz and Beck identified two main types of urban growth: *per capita growth* and *population-based growth*. Per capita growth is due to larger houses and land and is influenced by fiscal, urban and transportation policies, while population-based growth is due to the appearance of more bodies. Taken together, the two were almost on a par with regard to the urban expansion they caused, although the growth of population origin turned out to be a little higher.

For years the mantra in the American West has been: "We don't want to be another Los Angeles." We have considered LA as the queen of sprawl. However, as Kolankiewicz and Beck point out of LA, "No city in the United States can provide a better model of how to try to constrain sprawl by channeling population-based growth into ever-denser settlements, both in the urban core and beyond. in the suburbs". Believe it or not, since 1970 land use restrictions have made the greater LA metropolitan area the most densely populated urban landscape in the US, with just 0.11 acres per capita. The suburbs of New York City have "only sixty percent of the population density of LA." And yet, LA has expanded due to population growth.

Kolankiewicz and Beck delved into the study of the 100 largest cities in the US from 1970 to 1990 and calculated the percentage increase or loss of population and area per inhabitant. They then calculated the growth of each city in square miles¹⁴ and as a percentage of the original area. From there, they "obtained" the percentages of expansion due to both the growth of population origin and the consumption of land per capita.

Detroit ranked eighteenth in area, with a population loss of 6.9 percent and growth of 37.9 percent in individual land use. So, if we calculate the percentages of expansion, zero percent was due to population and one hundred percent was due to an increase in the amount of land occupied by each inhabitant. Los Angeles was sixth in area, with a population increase of 36.5 percent and an *decline* in per capita land use of 8.4 percent. Calculating its expansion, we obtain that one hundred percent was due to population and zero percent was due to the amount of land occupied by each inhabitant. The city I [Foreman] live in, Albuquerque, ranks forty-fourth in area with a population growth of 67.1 percent and an increase of 18.1 percent in consumption of land per inhabitant. When expansion percentages are calculated, 75.5 percent of the expansion is due to population growth and 24.5 percent to a larger individual footprint in terms of inhabited land consumption.

Overall, Kolankiewicz and Beck found that from 1970 to 1990, 50.9 percent of the expansion was due to population growth and 49.1 percent was due to per capita land consumption. What they discovered is impenetrable: "Smart growth," even if applied as well as in Los Angeles, cannot by itself stop expansion. The conclusion:

¹⁴ Surface measurement equivalent to about 2.6 km[2]. *N. from t.*

Only if population growth is also stopped can the expansion of new suburbs onto fertile farmland and wilderness be stopped.[716]

The reality - none of the Seven Ecological Woundsix can be healed without first stabilizing and then reducing the population. With a population increasing endlessly:

We will not be able to reduce greenhouse gas emissions.

We will not be able to get clean air and water for people to breathe and drink.

We will not be able to ensure that the other living beings that entered the 21st century with us will last until the 22nd century.

Welcome to the real world.

Jevons paradox

For some time we have been told that if each of us reduced our use of energy, water, food, gadgets, cars and miles driven, the total burden of all that stuff on Earth would lessen and raw materials would last longer. However, few of us have always known the truth: that this is simply not true.

At the end of the Civil War (1865), an economist named W. Stanley Jevons wrote a book about coal and how it was being used more effectively in steam engines. In *The Coal Question* he wrote, "It is a misconception to assume that economical use of fuel is equivalent to a decrease in fuel consumption. The truth is the opposite." Over a hundred years later, two economists, Daniel Khazoom and Leonard Brookes, also grappled with the "Jevons Paradox." In his article, "The Specter of Jevons' Paradox," Jeff Dardozzi notes, "They stated that higher efficiency paradoxically leads to an increase in *total* power consumption." As more researchers have studied this paradox, it has increasingly been seen to be unforgiving. Earthscan, a publisher of books and journals on climate change, sustainable development, and environmental technology, has published an entire book about her. *The Jevons' Paradox and the Myth of Resource Efficiency Improvements* reviews the history of this perplexing truth and the studies that prove its validity.

Dardozzi writes, "The second effect resulting from efficiency improvements is that when one saves money, it is usually spent elsewhere in the production system, and this translates into increased consumption of energy and resources." Take my city, Albuquerque, where older neighborhoods nag residents to save water. However, reducing the water consumed in watering the garden, bathing and flushing the toilet does not mean that Albuquerque sucks less water from the ground or from the Rio Grande. What it means is that this way there is "more" water to build new houses in the growing west part of the city or to establish new industries. In other words, people who have lived in a house for fifty years should let their peach trees die of thirst so that a builder can use it to make new houses and so that the buyers of those houses can come to live in Albuquerque. As Blake Alcott, an ecological economist, says of this shift taking place around the world, "[G]iven global markets and marginal consumers, the fact that one person stops using something allows another person to use it". Or put another way, in

the US we can reduce our car use, but the oil we don't burn will be gladly used by all new car owners in India and China.¹⁵

The Jevons Paradox also acts in relation to lighting. It demolishes the once hopeful prediction of Sandia Labs researcher Jeff Tsao. In 1999, Tsao wrote an official report showing that if conventional light bulbs were replaced by solid-state light bulbs, "The amount of electricity consumed globally would drop by more than ten percent." Ten years later, however, Tsao discovered the Jevons Paradox and how it acts on lighting. *Albuquerque Journal* science writer John Fleck notes, "As lighting has become more efficient—from candles to electric lights to kerosene to gas—what people wanted was more light, not use less energy."¹⁶

With the Jevons Paradox in action, what should we worry about? That engineers offer us truly cheap, infinite and clean energy sources. Why? Because nothing would ruin the Savage Earth faster and more completely than energy that was clean and too cheap to bother measuring. This would also allow the population to grow even more.

What is the way to escape the Jevons Paradox? First stabilize the population and then reduce it.

The legacy of carbon

There are many people who want to reduce their ecological footprint. However, many people don't realize that the biggest way to reduce that footprint is by having fewer or no children. Research by Statistics Professor Paul Murtaugh and Oregon State University Professor of Ocean and Atmospheric Science Michael Schlax shows that children greatly increase the size of people's carbon footprints. *The New York Times* reports that, "Take, for example, a hypothetical American woman who upgrades to a more fuel-efficient car, drive less, recycle, install more efficient light bulbs and replace your fridge and windows with other energy-efficient models, researchers have found

¹⁵ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹⁶ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

that if you have two children your carbon footprint will end up being nearly 40 times what you avoided by doing so.¹⁷

forty times.

Murtaugh and Schlax published their research in the scientific journal, *Global Environmental Change*.¹⁸ To calculate the “carbon legacy of an individual”, they looked at how many children, grandchildren, etc., they had and made a “measurement formula” expressing the Impact of each descendant based on the degree of kinship. In their own words, “That is, a parent is responsible for half of their children’s emissions, a quarter of their grandchildren’s emissions, and so on.” They also calculated how much someone could reduce their carbon footprint by making six lifestyle changes and found that it was about 486 metric tons of CO₂ over the lifetime of an average American woman. But the carbon legacies of each child born, taking into account emissions in three different scenarios, turned out to be between 9,441 and 12,730 tons. In other words, not having children reduces a woman’s carbon legacy twenty times more than making six lifestyle changes. What Murtaugh and Schlax have found is, essentially, that against the decision not to have a child, all the other “green” lifestyle changes, taken together, seem insignificant.

Murtaugh and Schlax have cleverly shown the weight of P in I=PAT. Murtaugh points out that his “calculations are applicable to environmental impacts other than carbon emissions - for example, consumption of fresh water, which many consider to be already in short supply.”¹⁹ Their steps may be followed by studies measuring Population and Affluence, as well as other ways we harm life on Earth.

These studies and analyzes agree that we cannot reduce Impact by reducing only Opulence. Population is the most important factor in I=PAT. Probably carries more weight in I=PAT than Opulence. Think of it this way: Americans have the largest per capita Footprint of Affluence in the world. Therefore, any population growth in the US implies a growth in that Footprint of Opulence. Population growth in the US does more harm to the world than population growth anywhere else, due to our exaggerated Affluence.

The world cannot afford more Americans.

¹⁷ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹⁸ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

¹⁹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

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Presentation of "ISLANDS OF CIVILIZATION" AND THE REPLICA "A MINORITY WAY OF SEEING THINGS"

The following two articles have been written by two conservationists who value Wild Nature and are concerned about the destruction it is currently being subjected to, but who, nevertheless, represent two very different approaches when it comes to identifying and deal with the causes of such destruction.

Roderick Nash is a delusional techno-utopian, humanist and idealist who, instead of identifying civilization (large societies with large urban centers and a high human population) and technological development as the real causes of the destruction and subjugation of wild Nature, considers that the ultimate cause is the assumption of erroneous values and ideas about the place of human beings in the world and their relationship with the Earth. It is not surprising, then, that his recipe to avoid the destruction of Nature is based on changing the values and ideas of society and preaching an "environmental ethic" that directs relations between human beings and the rest of the Planet, without questioning technological development at all, but rather promoting it and happily skipping the most basic, obvious and inescapable physical limits and determinants .

John Davis, for his part, responds to Nash's absurd utopian technophilia by showing the inherent incompatibility between the conservation of wild Nature and the development of technological civilization. Such incompatibility is based on physical factors that extreme idealists like Nash tend not to take into account.

This contrast between the positions of both authors (disheveled idealism and technophile vs. realism) is what makes us think that it is interesting to publish these two texts. However, despite his greater sanity and tendency to realism, Davis, like the vast majority of conservationists, has an excessive idealistic streak that makes his response to Nash not as forceful and appropriate as it should be.

For starters, he does not question the validity of predicting, imagining, planning, and projecting about the future development of techno-industrial society, but even applauds Nash for doing so. A minimal knowledge of the operation of complex systems and processes or, simply, a minimum of reflection and awareness of the facts (historical

and current), would have shown Davis the absurdity of trying to predict, and even more voluntarily direct, the development future of a society. This has never worked and will never work. It is not even possible in the short term, let alone in the long term (for example, a thousand years from now as proposed by Nash). Dreaming of future "happy" societies, whether techno-utopian or primitive, is pure useless speculation that does not really help to combat effectively in practice and today the real causes of the destruction of wild Nature.

In addition to being a runaway idealist, Nash is a humanist who bases his speech on the concept of "law", proposing that future society should be based on an "environmental ethic" when relating to Nature. And Davis, although he certainly does not seem so humanistic, does not question this proposal either. However, the notion of "law" (an entelechy created to regulate social relations within human societies and which has recently been extended to relations with other species or natural entities) has nothing to do with real respect for wild nature. In addition, apart from the impossibility, mentioned above, that a society can voluntarily guide its development and operation based on an ethic, "environmental" or not, to propose such a thing is to put the cart before the oxen: what in the background determines the development, functioning, structure and ideology (including ethics or morals) of a society are material factors (geology, ecology, biology, climatology, demography, technology, etc.) not values or ideas (ethics in this case). Therefore, preaching values and moderation is not going to change a situation that is physical: the existence of the techno-industrial civilization necessarily and inevitably entails the destruction and subjugation of non-artificial systems on Earth, since it requires extracting energy from them. and necessary materials, pour the waste from their maintenance processes into them and occupy the space they occupy.

ISLANDS OF CIVILIZATION

By Roderick Frazier Nash¹

Today it is not new news that Planet Earth is not well. The problem, in a nutshell, is that one of the roughly thirty million species is growing, both in numbers and in impact on the environment, to levels that are unsustainable in the finite spacecraft carrying the only life through the cosmos. of which we have news. In this great community, the global ecosystem, *Homo sapiens* is no longer a good neighbor. Our ability to coexist responsibly with other forms of life began to disappear around 15,000 years ago, when we switched from hunting and gathering to ranching and farming. Since then, through technological civilization we have been taking environmental modification to dangerous

¹ Translation of the reprint published in *Wild Earth. Ideas for a world out of balance* (Tom Butler ed., Milkweed Editions, 2002) from "Island Civilization. A vision for the planet Earth in the year 2992". The article originally appeared in *Wild Earth* magazine 1, no. 4 (Winter 1991/1992): 2-4. © 1991 Roderick Frazier Nash. *N of the t.*

extremes. There are now signs that with our tendency to grow uncontrollably, human beings are a kind of cancer in the Earth's organism. Like cancer cells, we are very good at growing. We both [cancer and humanity] do well in extreme contexts where expansion is a virtue. But in the end, and ironically, we both failed because of our own success. It's worth remembering that by the time cancer reaches its peak, the host organism is about to die, *but that's cancer*. Human beings too will go down with the ecosystem ship unless we develop the capacity for self-control.

Today we are witnessing the most powerful environmental movement in history. In the 1990s, there was talk of a green decade and the next green century. And we're starting to do some things reasonably well. Recycling, clean production and energy efficiency are more than just slogans. However, today's ecologists lack vision. I mean a long-term vision: a vision of how we want civilization to be a thousand years from now. Without it, we will have no compass to guide us through the ecological seas of the future that are sure to be stormy. Lacking long-term vision, we are like a skier whose attention is focused on a point on the slope fifty feet² below. Short-term performance (contemporary conservation) can be impressive. But ahead lies a precipice (the threshold of irreversible change in the planet's life support systems) and the nearsighted skier risks making perfect turns, straight into the abyss! We need bifocal vision. We have to act on the day-to-day and year-to-year scenario but, at the same time, we have to keep an eye on the big, long-term context. Now we are playing God. For better or for worse, though probably for worse, the future of the planet is in our often clumsy hands.

The vision that I am going to present will be controversial since I am going to deal with important and difficult issues that imply the subordination of human interests to the biotic whole. Even biocentrists and deep ecologists will disagree with part of my proposal. However, before the blood reaches the river, let me underline the general importance of futurist thinking. If you don't like part or all of my Island of Civilization dream, believe yours. What is essential is that from time to time we look up from everyday details to the far horizons of planetary possibilities. Where do we want our species, and nature in general, to be a millennium from now? Without such goals there can be no direction. And without direction we drift towards an increasingly terrifying environmental abyss.

I will start with four hopes or goals that I have for the future of human activity on Earth. The adjustments I propose are intended to help its realization. First, I hope that our presence on the planet can be sustained for many thousands of years. I do not share the misanthropy of most radical deep ecologists whose extreme biocentrism leads them to believe that the best thing *Homo sapiens* can do is commit suicide as a species. Nor do I place myself among the futurists who hope that our main habitat in a thousand years will no longer be Earth. Regardless of whether expanding through space works or not, it seems to me that we are morally obligated to take care of our

² 1 foot = 30.38 cm. *N of the t.*

first home. Abandoning a ravaged Earth in search of greener planetary pastures would be, to say the least, the height of ingratitude.

Second, I believe in the existence of rights for all species and normal ecosystem processes. In addition, I believe that these rights are above the rights of human beings to increase their population, their opulence and their occupation of the habitat. I hope that the spate of species extinctions occurring today can be stopped and that environmental ethics guide future relationships between people and the planet. The moral community should be identical to the ecological one at heart. I hope natural rights are expanded to encompass the rights of nature. It is my hope that a thousand years from now not only all human beings, but also four-legged beings, rooted beings, flying beings, and microbes will all unite together in one vast ecological brotherhood. Building on the 1963 rhetoric of Martin Luther King Jr., I say let freedom ring not only from and *for* Stone Mountain in Georgia, but also for oceans, rivers, and forests everywhere.³

Third, I hope that a significant amount of land on this planet will remain wild forever.⁴ I do not celebrate a totally humanized and homogenized environment, no matter how beneficial or favorable it may be. The preservation of the wilderness⁵ is essential, not just for human entertainment but as a gesture of planetary modesty by a species that desperately needs to be reminded that it is only a member and not the owner of the ecosystem. Aldo Leopold understood this in the 1940s, when he warned that the first law of success when trying to fix something is to keep all the parts. The second law, we might now add, is to conserve instructions: and these are contained in healthy wild ecosystems.

Finally (and here I hope to be in the company of my respected colleagues from the most radical frontiers of environmentalism), I look forward to the full development of human intellectual and technological potential. The sticker that says “Let’s go back to the Pleistocene”⁶ does not appear on the back of my car. I believe that many of the features of civilization are worth protecting and expanding. What’s wrong with

³ The author refers here to a phrase from a speech by Martin Luther King: “Let freedom ring from the Stone Mountain of Georgia”. The phrase refers to the “Liberty Bell”, a bell that was used in 1776 to summon the citizens of Philadelphia to the reading of the Declaration of Independence. This bell symbolizes the independence of the United States, the abolition of slavery and freedom. Stone Mountain is the largest open-air granite massif in the world. At its feet is a city with the same name. At Stone Mountain, in 1915, the Second Ku Klux Klan was founded. There is also a theme park that among other attractions has a monument to the Confederacy carved into the rock of the mountain. *N. from t.*

⁴ “I hope that a meaningful amount of wilderness will remain on this planet forever” in the original. *N. from t.*

⁵ “Wilderness” in the original. “Wilderness” refers to lands or ecosystems that are little or not at all humanized, although it can be translated in different ways depending on the context. In the present text it has been translated as “wild lands” or “wild ecosystems” unless explicitly stated otherwise. *N. from t.*

⁶ “Back to the Pleistocene” in the original. It is one of the catchphrases popularized by Earth First!, among others. *N. from t.*

symphonies, universities and modern medical technology? Computers, television and nuclear power are wonderful tools - as long as we know how to use them responsibly. And what wonders could there be in a thousand years?

Let's see, technology is not the basic problem. Machines only express human values. Change these values and you can alter the most basic of contaminations: mental contamination. And, since we are in control, profound change is theoretically possible. The trick, as Henry David Thoreau recognized a century and a half ago, is to "ensure all the advantages" of civilization "without suffering any of its disadvantages." Furthermore, don't a reasonable number of human beings have as much right to develop their evolutionary potential as any other life form? *The essential requirement is that in doing so they do not endanger, or eliminate, opportunities for other species to do the same.*

My vision of the world in a thousand years begins with the assumption that, on a finite planet, shared with other species, only a limited number of human beings will be able to enjoy unlimited opportunities. Moderation, in other words, is the key to progress. In fact, less is more. The first essential limitation must be in our number. We are now 3.5 billion and growing - fast. Demographers believe that between one and two billion humans, living carefully and efficiently, constitute a sustainable population. So , in 1992, I advocate 1.5 billion human beings maximizing their potential while respecting the potentials of other beings. Wouldn't this be preferable to being 14 or 40 billion merely subject to a pathetic existence on a biologically impoverished planet?

The other main application of moderation demanded by my proposal concerns living space. From the point of view of other species, one of the worst features of contemporary human civilization is its tendency to expand. In the last five centuries in temperate latitudes, we have seen a terrifying explosion of human-modified environments. In Europe and large parts of Asia, Africa and North America, we are approaching saturation. If left unchecked, this expansion could affect the entire planet. Bear in mind that in the next thousand years we are going to witness an extrapolation of technical capabilities beyond our wildest imaginations. Protected cities under domes covering the poles and underwater subdivisions of them are not inconceivable. Instead of this explosion, I advocate an *implosion*.

My dream for the next millennium shows most of the 1.5 billion human beings living in 500 concentrated habitats. Embedded within each would be the means of food and material production and power generation. In the vast spaces between these human habitats would be the habitats of other species. Most of the planet in 1992 should have returned to a wild state⁷. Instead of dominating the world, humanity and its works should occupy small niches in a continuous wild ecosystem. Instead of islands of wilderness surrounded by a sea of civilization, as is the case today, we would have *Islands of Civilization*.

⁷ "Wilderness condition in the original. *N. from t.*

I use the term “habitats” instead of “cities” to imply that these human environments will be different from anything else we know of. Home to around 3 million people each, they could be a mile, both high above the ground and deep below it or, perhaps, under the surface of the sea. The technology of 2992 would allow habitats to exist anywhere on the planet. Civilization could spread across the poles, but it would be radically reduced in temperate latitudes. To better understand what I have in mind, consider that legally protected wilderness areas⁸ in 1992 constitute about 2 percent of the land area of the forty-eight contiguous United States. In 2992 the proportion would be the inverse; the Islands of Civilization would need no more than 2 percent of US soil. This is a much bigger “Outside” than even Dave Foreman has ever imagined⁹. An explanation is needed.

First, keep in mind that a thousand years from now all 1.5 billion people on Earth will be using technology that is unimaginable today. For example, there will be no need to cut down trees in 2992; wood will have become obsolete as a building and printing material (along with, perhaps, newspapers and books). With the energy, water, materials, and food produced in or near habitats, dams and aqueducts will disappear, and with them all long-distance pipelines, cables, and pipelines. Highways and railways will no longer exist. All transportation in 2992 will be by air, and most likely instantaneous. They will say that it is science fiction, right? Well, consider what they thought in the 1990s about moon landings. I believe that if human beings can keep the planet in a habitable state, they will have limitless technological potentials. Let our best minds work on the technical challenges of the Islands of Civilization (rather than fixing the old, unsustainable ways of doing things) and we won’t have to go back to the Pleistocene to find a low-impact model of life.

What would it be like to live on the Islands of Civilization? When facing this important issue, it is necessary to put aside the image of an apartment building similar to a termite mound. I am confident that the architects of the future, building on the ideas of visionaries like Paolo Soleri, will be able to design very dense and very attractive habitats with a simple structure. Of course, sacrifices will have to be made. What will have completely disappeared in the imploded habitat of 2992 will be the “American Dream”: single-family homes on half-acre plots¹⁰ far removed from business and cultural centers and connected by highway networks in an almost woven fabric. continuum of civilization.

However, since I have an *intensely* urban culture in mind, I envision far more possibilities for contact with high-quality¹¹ wild nature than exist at present. Only a few miles from the civilized islands will be where the wild things are: bears, wolves, elephants and tigers, but also the full complement of the humbler species whose presence

⁸ “Legally designated wilderness areas.” *N. from t.*

⁹ Referring to Dave Foreman and Howie Wolk’s book *The Big Outside* [*The Big Outside*] (Ned ludd Books, 1989), on large ecosystems American savages. *N. from t.*

¹⁰ 1 acre corresponds to approximately 0.4 hectares. *N. from t.*

¹¹ “Wilderness” in the original. *N. from t.*

determines biodiversity and ecological health. Those who venture into these wild lands, paradoxically wilder thanks to a more advanced technological culture, must do so following the terms imposed by them. This will mean that people will have to show restraint in how they enter and what they take into the wilderness. It will mean training and education in relation to behaving appropriately and responsibly in nature¹². The techniques for living in the wild¹³ will be known to most by 1992 as all able-bodied citizens will have attended the University of the Wilderness. This compulsory educational period would be given at the end of secondary school, at the age of about twenty, before going on to college or choosing a profession. I'm not talking about two-week Outward Bound¹⁴ courses but several years of hunter-gatherer life without any contact with the islands of civilization. This is where we will return to the Pleistocene! Young people, organized in tribal groups, will follow caribou through mountain passes and fish for salmon whose migrations have been restored by free-flowing rivers. They will learn the ancient and primitive techniques and, more importantly, the wisdom about the land and the reverence for it that the indigenous peoples had.

Could anyone live off the land a thousand years from now? You can bet, considering that the number of young people between the ages of eighteen and twenty who would do so would be roughly equal to the Pleistocene human population, and also considering that ecological integrity (especially the health of animal populations) would have been restored. For example, in 1992, the Great Plains of the United States, under my scenario, would consist of three human habitats occupying a few dozen square miles and 100,000 square miles of wilderness prairie. The bison would have returned, along with the wolf and the grizzly bear. Humans could take their place alongside the other predators. Southern California would have several human habitats, but on the hundreds of miles of wild coastline hunting and gathering opportunities would be as good as they were for the ancient Chumash¹⁵. Likewise, equally good would be the opportunities to acquire an environmental ethic that underlies the ecological responsibility of the Islands of Civilization.

Discussing how to make the Civilization islands dream come true is beyond the scope of this text. Suffice it to note that if the path of reform proves ineffective, the radical option of force or revolution will increasingly make sense, especially for a population shocked and frightened by the first signs of ecological catastrophe. Violence, after all, has often been part of human history as a way of changing paradigms. The American Revolution and the Civil War come to mind. The abolitionist movement led to the violent resolution of the problem of slavery in the United States in the 1960s. Environmentalism could similarly rationalize the use of force for the liberation of nature. Or, as some are beginning to point out, the violence may come from nature, striking

¹² *Idem. N. from t.*

¹³ "Backcountry skills" in the original. *N. from t.*

¹⁴ Outward Bound is an international non-profit organization dedicated to carrying out personal development programs based on facing challenges in nature outings. *N. from t.*

¹⁵ Amerindian people of central and southern California. *N. from t.*

back and ridding itself of the menacing human cancer. However, whether by choice, coercion, or through catastrophe, *there will be* an end to the current unsustainable levels of growth and devastation. It may be closer than we think. The twenty-first century may be the last in which we have the option of correcting the course of civilization through deliberation.

I am a historian, and from my perspective humanity today is at a crossroads not only in human history but in the entire evolutionary process. Life has evolved from stardust over billions of years until one species has evolved the ability to disrupt the entire biological miracle. However, in the midst of the fear that this thought leads us to, there is something that reassures. We are not threatened, like the ecosystem of dinosaurs, by a death star. *We are the star of death*. We could also be the star of ecological salvation. This is simply the biggest challenge life on Earth has ever faced. Will the vision of the Islands of Civilization help?

A MINORITY WAY OF SEEING THINGS. A REPLY TO “ISLANDS OF CIVILIZATION”

By John Davis¹⁶

I cannot resist writing an editor's reply¹⁷ to the above article. But first, let me underline the importance of Professor Nash's article, regardless of the strengths and weaknesses of his particular suggestions. Rod Nash has made a profound suggestion: people need to start planning according to the needs of life forms - all life forms - a thousand years from now, or more.

I agree with 98 percent of your proposal, but find the other 2 percent disturbing. I raise the following objections to "Islands of Civilization" with the utmost respect for Professor Nash - one of today's leading historians and environmental ethicists. No one else associated with *Wild Earth* should be held responsible for what follows. These objections emanate from the perspective of someone who is a walking anachronism.

1. To speak of the Earth as if it were a "spaceship" or an "ecological ship" is to hurl insults at the only biologically diverse world we know of. This might seem like a small thing, but the metaphors we use strongly influence the way we think about and interact with the natural world.

2. As Jerry Mander argues in his brilliant book *In the Absence of the Sacred*, it is time we disabused ourselves of the notion that technology is neutral. The technologies developed in the past 15,000 years have almost invariably led to the exploitation of nature, centralized power structures, and biological impoverishment. History does not

¹⁶ Translation of the reprint published in *Wild Earth. Ideas for a world out of balance* (Tom Butler ed., Milkweed Editions, 2002) from "A minority view. A Reunion to „Island Civilization". The article originally appeared in *Wild Earth* magazine 1, no. 4 (Winter 1991/1992): 5-6. Copyright © 1991 John Davis. *N of the t*.

¹⁷ Davis was part of the group that edited *Wild Earth. N of the t*.

support the idea that it is possible for post-Paleolithic technologies to be used in a benign and sustainable way. When our ancestors developed the precursor tools of technology, they should have been content with ceramic pots, spears (perhaps) and - most importantly - fire. We could have happily spent millennia looking at fire, telling stories about it, creating myths, and perfecting appropriate uses for its tremendous power.

3. Professor Nash has used three extra zeros in expressing his recommended population: 1.5 billion would almost certainly be incompatible with a fully flourishing biodiversity; 1.5 million is enough. Some will say that the idea that we can peacefully reduce our population to 1.5 million is ridiculous. Not that much. If we all start now to simply stop having children, we can reduce our number by three orders of magnitude in less than a hundred years. (I recognize that enforcing a moratorium on births will be problematic.) What's more, 1.5 million exceeds what most conservation biologists consider a minimum viable population for a large mammal. If human migration corridors (paths along what might once have been highways, for example) were maintained, a global human population of less than a million could easily preserve its genetic diversity.

4. We could be "playing God" already, but we shouldn't. Conservationists should oppose such arrogance at all times. The idea of biological evolution being run by a bunch of bumbling naked apes—some of whom would wear thick glasses and clad in white coats—is unappealing at best.

5. The islands of civilization would almost inevitably cause extinctions, thereby violating the right to existence of other beings. If we take seriously the idea of intrinsic and inalienable rights for all forms of life, we cannot simply abandon any significant portion of the biosphere to human domination. All areas have their unique ways of life. Biologists are continually raising their estimates of the number of species on the planet (as well as the number of species going extinct each day). Recent studies suggest that even the ocean floor (which Nash says could one day be inhabited by humans) has an unspeakably large biodiversity. As scientists conduct increasingly intensive studies of ocean sediments, forest floors, river beds, caves, and other relatively unknown environments, they may well find a diversity of organisms as high and localized that we are forced to recognize that any fully humanized landscape will extinguish unique forms of life - each of which has as much right to exist as *Homo sapiens*.

6. Islands of civilization would perpetuate our estrangement from nature. If we spend most of our lives in humanized environments, and especially if we don't experience the Great Outside¹⁸ until the age of eighteen, we won't gain the wisdom about Earth or the knowledge of place. We'll be sleepy idiots.

7. Unless we accept the old Judeo-Christian idea of *creatio ex nihilo* (creation out of nothing, a capacity historically attributed only to God and the capitalists), it is

¹⁸ "The Big Outside" in the original. The expression refers to the great wild spaces (See note 9). *N. from t.*

difficult to see how these great concentrations of people could support themselves without exploiting the outer regions. Human beings cannot permanently violate the laws of nature, in particular the second law of thermodynamics (entropy).

8. I repeat, human beings will remain at war with nature as long as they continue to use high technology and live in artificial environments; as long as they refuse to be normal members of the biotic community. Moreover, as long as we are at war with nature, we will continue to be like a cancer. It seems extremely unlikely that a living organism could harbor 500 benign tumors for very long. Sooner or later, a tumor will turn malignant. Then the metastasis will come; and not long after, we'll be back in 1991.

To end these crude and hasty objections: Roderick Nash has done us a great service by making us look ahead and giving us an attractive picture of what the world might be like a thousand years from now. I suggest, however, that a small part of his vision needs to be radically modified. Indeed, we are like skiers heading blindly into an abyss. Let's stop, therefore, let's take off those plastic appendages, let's go back up the mountain while we still remember the way and slide with dignity down the slope by which we once came... back to the Pleistocene.

LEFTISM: The function of pseudo-critique and pseudo-revolution in techno-industrial society¹

Definition:

Ultimo Reducto regards as “leftism”² any current or social tendency that is based on the following values: *equality*, extended *solidarity*³, *compassion* toward alleged groups of alleged victims (with these or other names as “*social justice*,” “*cooperation*,” “*brotherhood*,” “*universal love*,” “*peace*,” etc.).

In general, the concept of leftism includes almost any apparently *critical* current that in reality does not try to combat modern society, but to “improve it.”[897]⁴ Leftism, *usually*, does not try to end techno-industrial society, but only tries to make it meet the above values. That is, it tries to make society be (more) “just,” (more) “egalitarian,” (more) “caring,” etc. There are also “*radical*” leftisms that say they try to combat the system (normally adding the adjectives “capitalist”, “imperialist” and/or “patriarchal”), but they always do so on the basis of those values.

¹ Updated version of November 2017. © copyright 2017 for the English translation, Last Redoubt. © copyright 2007 for the original version in Spanish, Last Redoubt.

² Perhaps “leftism” is not the most appropriate term to express what Ultimo Reducto refers to here. Everyone has some intuitive notion of what “leftism” is, but often these notions vary considerably from one individual to another and few are able to correctly and consistently explain their idea of “leftism.” Furthermore, not everyone who is regarded as leftist is always actually a leftist, and not everyone that is actually a leftist, is always regarded as leftist (certain incomplete notions or definitions, often, do not cover all the forms of leftism really existing - for example, they consider that leftism is comprised only by Marxism-Leninism, or only by anarcho-syndicalism, or only by the “antagonist” subculture, etc.-, and certain overreaching and vague notions and definitions might include currents that are not, in reality, leftist -for example, certain kinds of Islamism-).

³ The expression “extended solidarity” refers to solidarity (ie, support, identification, brotherhood, loyalty, cooperation, etc.) beyond the natural social reference group (the group comprised by those few individuals close to one; the “loved ones”).

⁴ Techno-industrial society must be fought, not reformed, because it inevitably undermines the autonomy of the functioning of nonartificial systems, ie of the wild Nature, both external and internal to humans. To go deeply in this issue, see, for example, Theodore J. Kaczynski, “Industrial Society and Its Future” in *Technological Slavery*, Feral House, 2010 .

Leftism includes, in general, that which is usually understood as *the left*, but not only this. The concept of “the left” is usually (almost) synonymous with *socialism* (in almost all its versions, including *libertarian* or *anarchist* ones), but there are also nonsocialist “leftisms” (for example, all the currents and humanitarian initiatives derived exclusively from philosophical *liberalism* or from *Christian philanthropy* some grassroots organizations, some charitable organizations, some missions, etc.). In fact, at least some of the *fundamental* values and ideas of the greater part of what is today called “the right” *deep down* are the same as those of what is called “the left.”

Leftism, in particular, includes all the struggles and initiatives, *governmental or otherwise*, in favour of the *equality* and the *rights* of the alleged “*oppressed*” (“*anti-patriarchism*” in general and *feminism* in particular, *gay “liberation,” antiracism, solidarity with immigrants, helping the poor*, initiatives for the *social integration* of the marginalized and excluded, *defence of the workingclass, of the unemployed, of the disabled, of the animals*, etc.), in favour of *development* (“sustainable,” they tend to add), of *justice*, of *peace*, of “*freedoms*” and “*rights*” and of *democracy* in general (struggles for the *redistribution of wealth*, currents favourable to the “*normalization*” of *drugs* or “*sexual liberation*,” *antimilitarism, pacifism, social “ecologies”* -that currents of so-called environmentalists who focus primarily on purely social matters, prioritizing them over real ecological problems⁵ and *environmentalisms* -those currents whose real function is to maintain an environment habitable enough so the human population can continue successfully fulfilling the demands of techno-industrial society-, *anticapitalism*, etc.). It includes, thus, virtually all those things described as “*social*,” “*antiestablishment*,” “*protest*,” “*adversarial*,” “*alternative*,” “*countercultural*,”...

movements, as well as the vast majority of *NGOs*, and any initiative, *official or not*, based on promoting equality, (extended) solidarity and the defence of alleged victims (which today includes a good part of the activities of governments and institutions).

It is usually believed that “*progressivism*” and “leftism” are synonymous, and certainly this is normally the case, but not always. If the idea of progress⁶ that progressivism defends is based on the increase of equality, solidarity (beyond the natural social reference group constituted by those individuals close to one) and defence of supposed victims (which is usually precisely the notion of progress in almost all of contemporary progressivisms), then this progressivism is leftism. But not all progressivism has this humanitarian idea of progress: nineteenth century colonialism, for example, used for the justification of its atrocities another, much less “delicate” idea of progress, not compatible with leftist progressivism.

⁵ This does not imply that those environmentalisms that are not “social”, ie, those environmentalisms that place ecological problems over social problems and call themselves ecocentric, are never influenced by leftist ideas and values. In deed, unfortunately, too often, it happens to be the opposite: many times, their theory, their rhetoric, and their ranks use to be tainted by leftism too.

⁶ Progress: The belief in the *absolute goodness* of some process of development.

On the other hand, although leftism is usually openly progressivist, there are also minority leftist currents *seemingly* contrary to progress, i.e., *supposedly* not progressivist.

Nowadays, and for some decades now, the dominant ideology in techno-industrial society is leftist. Institutions and the mass media are based on the fundamental leftist values of equality, (extended) solidarity and victimism, and they transmit and put into practice these values, supporting and encouraging proposals that were formerly defended exclusively by minority sectors (the leftists at the time). It is enough to observe institutional propaganda, the news, mass forms of entertainment and art, etc. to notice it. As a result, the general population has more or less assumed the leftist values of this propaganda.

Nevertheless, many people are sure that these leftist values are, not only a minority view, but also contrary to those of current modern society, which they consider unsupportive and contrary to equality. This belief is itself a fundamental part of leftism, justifying and promoting it.

Evaluation:

Leftism helps the system

Equality, solidarity with individuals and groups who are not close to oneself, and helping alleged victims and oppressed people, are essential to avoid conflicts, tensions and antisocial behaviours contrary to the efficient functioning of the social machinery. These values are necessary for the maintenance of the cohesion of techno-industrial society and to avoid its disintegration and disorganization. By assuming them as its own and promoting them, leftism *helps* the system.

Leftism is based, therefore, on values that are essential for techno-industrial society. As a result, that what leftism questions is not the system itself, but only that, according to leftists, the system does not sufficiently live up to its values and that, therefore, it does not pursue the ends they imply. So, the effect of leftism can never be the end of the system, but the “improvement” of it, so that it will run more efficiently. Consequently, leftism is inevitably *reformist* and never really revolutionary⁷⁸. When leftism does not recognize itself as reformist and presents itself as “revolutionary,” it is *pseudorevolutionary* (which is common in the more radical forms of leftism).

Leftism is a *mechanism of alarm, self-repair, self-maintenance, and self-catalysis* for the functioning and development of the techno-industrial system. With its critiques, leftism acts as an alarm mechanism that points out the weak points, the contradictions,

⁷ Although, in reality, all defend, in one way or another, some form of progress, if only a progress that is immaterial, moral, “spiritual”.

⁸ The term “reformist”, in this text, means “that promotes mending the techno-industrial system, not eliminating it”. The term “revolutionary”, in this text, would be its antonym, ie, it refers *only* to that who or which promote eliminating the techno-industrial system, not mending it.

the limits, the failures, etc., of the techno-industrial system. And with its proposals favours the repair and readjustment of the system, promoting “improvements” or, at least, palliatives, actions that serve to reduce the social, psychological and ecological tensions that can hinder the maintenance, functioning and development of technoindustrial society. Leftism *lubricates the social machinery* instead of destroying it.

Moreover, with its proposals, activism, groups, environments, aesthetics, paraphernalia, ideology, etc., seemingly critical, combative, rebellious and radical, leftism offers artificial substitutes, innocuous to techno-industrial society, for certain tendencies and natural human psychological needs incompatible with the maintenance and development of the techno-industrial system (for example, it replaces the natural human sociability, which, in order to be fully satisfied, demands that social groups are smallscale groups -i.e., groups in which all members are able to know well and interact directly with each other-, with the sense of belonging to large organizations and/or to leftist environments and subgroups). It also redirects and makes harmless for the system certain impulses and reactions which, if expressed spontaneously, may be harmful or even destructive for the structure and functioning of techno-industrial society (for example, leftist activism serves to relieve the hostility caused by chronic frustration generated by the techno-industrial way of life, so that it will not really and seriously damage the functioning and structure of the system). Thus, leftism, with its proposals, offers to individuals a false illusion that embracing it they can act naturally and freely within techno-industrial society, and with its practices, it offers them the impression, no less false, of being rebels. It functions, therefore, also as a *psychological safety valve* for the system.

Moreover, because of its role as a psychological safety valve and its appearance, often, of being pseudo-critical and pseudo-revolutionary, leftism acts as a *trap* that attracts truly critical and potentially revolutionary people and groups, neutralizing them and transforming them into leftists in turn. Leftist environments and currents make use of *politically correct*⁹ *oversocialization*¹⁰ (taboos and dogmas) to imprison within its leftist ideological and psychological frames the natural, original, and poten-

⁹ Actually, the so-called “political correctness” refers to the set formed by the ideas and values that most people in a human social group assume as indisputable at a given historical context. Political correctness is, in fact, a phenomenon that appears in any social environment and in any time, and its content (the ideas regarded as indisputable) can be, at first, very diverse. However, nowadays, in the technoindustrial society, the expression “political correctness” is used almost only in reference to some allegedly indisputable ideas and values that are clearly close to those of leftism and that come, to a great extent, from it. In this text, Último Reducto uses the expression “political correctness” (and its derived expressions) only in the latter restricted sense.

¹⁰ Oversocialization: The *excessive* internalization by the individual of the values of his social environment, so that he is unable to violate them without feeling shame or remorse. It affects, to a greater or lesser extent, almost everyone, but especially those individuals who are more susceptible to the influences of their social environment. It is a common phenomenon in the current techno-industrial society (although not only in it) and it is especially abundant and intense in its leftist subsystems. It has a lot to do with the notion of “political correctness,” since it is what the latter permits to be imposed.

tially revolutionary ideas, values, motivations, ends, etc., of many of those that contact them. This way, those who independently come to feel discontented with what techno-industrial society is doing with the non-artificial world and with human nature, in their attempt to contact others with similar concerns, often approach leftist currents, environments, and groups, since these appear to be critical. Many people become unconsciously and psychologically trapped by these environments, establishing affinities and socio-emotional ties with them that neutralize these people's capacity for reaction and criticism, and, just so they end up, to a greater or lesser extent, tacitly or explicitly, and willingly or reluctantly, abandoning and sidelining their own values and original attitudes and adopting leftist values, dogmas, taboos, rhetoric, theories, and (sub)culture.

And it also works in the opposite sense: when struggles, environments, currents, theories or initiatives critical of techno-industrial society, at first foreign to or little related to leftism, emerge, many leftists (especially the more radical types) usually feel attracted to them, *invade* the critical *environments and struggles*, originally outside of leftism, and/or *adopt* their rhetoric as their own, *distorting* them to ensure that they conform to the theories and basic values of leftists, resulting in the *conversion to leftism* of these struggles or initiatives that were originally not leftist initiatives, and thus their *deactivation* as potentially revolutionary struggles.

Leftism, therefore, also acts as a *self-defence mechanism* to cancel out those impulses initiatives and attitudes that are rebellious, dysfunctional and potentially dangerous to the techno-industrial system, and to utilize them (by way of psychological and ideological “jujitsu”) in favour of industrial society, integrating them into leftist environments and currents.

Leftism as cause and effect of psychological alienation

Leftism is a result of alienation, of a state of psychological weakness and illness, often caused by the conditions of life inherent to techno-industrial society. Modern technology and the social system that it unavoidably implies deny individuals the possibility of developing and satisfying fully and autonomously their natural tendencies, abilities, and needs, i.e., their liberty, inhibiting and perverting the expression of their nature. They totally deprive individuals of the ability to exercise control over the conditions that affect their own lives and they violate their dignity by turning them into beings that are helpless and completely dependent on the system. They force people to live in unnatural conditions for which they are not biologically prepared (noise, high population density, fast pace of life, rapid change in the environment, hyper-artificial environments, etc.). They regulate and restrict human natural behaviour in many respects. All of this creates psychological distress in many individuals (low self-esteem

and feelings of inferiority, boredom, frustration, depression, anxiety, anger, emptiness, etc.). And that discomfort is often expressed in the form of victimism, hedonism, hostility, etc. These feelings and attitudes are common in techno-industrial society and give rise to various unnatural behaviours. Leftism is one of these behaviours. Its core values are inspired by feelings of inferiority, and many of its theories, discourses and activities are motivated by a lack of self-confidence, hostility, and boredom. And, since leftism in reality favours the development of techno-industrial society, it acts as a feedback mechanism for alienation and, with it, for itself.¹¹

Leftist values and ideas are contrary to reality, to reason, and to truth

The majority of leftist theories are logically, empirically and philosophically absurd. Leftism is based on notions about the world, the society, the human, and the natural that do not correspond with reality. Core leftist values and ideas, as well as some other ideas and values that tend to be associated with leftism, are, at best, perversions of natural and correct values (for example, extended solidarity is a collectivist adulteration of natural solidarity between close individuals), and, at worst, mere nonsense based on a flawed logic (relativism, for example) and on the distortion of facts to make them fit leftist theory, goals and values (e.g., the idea of a virtual inexistence of a human nature in human beings, who are regarded as mainly or only cultural, social or historical beings).

Leftism is contrary to Nature

Leftism is *a threat to the autonomy of wild Nature*, including true *human freedom*¹². In spite of at least some of the leftist goals seem to be laudable and desirable at first glance (and this is why many people embrace and support them), the attaining of leftist goals would be actually a real disaster regarding both, true human freedom and the autonomy of wild Nature. This is so not only because leftism favours, as we have seen above, the development of the techno-industrial system, but also because, in considering that equality, extended solidarity and the defence of victims have priority over any other value, leftism neglects, or even despises the autonomy of the non-artificial - because, indeed, the latter is incompatible with leftist basic values (wild Nature, human

¹¹ This is only a general approximation of the psychology of leftism. One could make many distinctions in this respect. Like for example, that it is not always the alienation produced by modern life that causes the psychological traits of leftism. Many leftists are simply psychologically weak by nature.

¹² True freedom (or true liberty) is the autonomy in expressing and fulfilling one's own tendencies, needs and abilities, ie, one's own nature. It has nothing to do with the elimination or avoidance of natural limits (humanistic concept of freedom), or with the so-called "civil freedoms" or rights.

nature included, is not egalitarian, caring or compassionate, except within some very restricted limits). In order to try to implement leftist utopias, it would be necessary to utterly subjugate both, human beings in particular and wild Nature in general.

Conclusion:

This point is especially aimed at all those who would like to do something to try to really end the techno-industrial system but, because they feel a genuine and justified rejection of leftism, they prove to correctly be very suspicious of the majority of currents apparently critical of the current techno-industrial society.

How must they act with respect to leftism?

- *Criticize it*, revealing what it really is: a deception, a trap, a mechanism of the system to perpetuate and grow itself more easily and efficiently, a poor substitute for real rebellion and the crazy result of unnatural conditions inherent to modern life.

But, criticism at leftism must not become a goal in itself. It must only be a means, a practical requirement, essential nowadays to try to achieve a much more important goal: to eliminate the techno-industrial system and to put an end to the subjugation of wild Nature external and internal to human beings that this inevitably entails.

- Avoid falling into the trap. *Try to maintain a strict separation from leftism*, its influences, its environments, its values, theories and speech. And, vice versa, keep leftism away from them; try so that their values, theories and speeches are not ¹³ absorbed, perverted or disabled by leftism.

- *Do not be ashamed to have values and ideas that are not leftist*. Do not allow the oversocializing reactions, the politically correct leftist dogmas and taboos to influence them. This in turn will help keep leftist away from them, avoiding their harmful influence.

¹³ In this respect, we must fall into naivety and superficiality by believing that anyone who appears to reject leftism is really not leftist. It is not enough simply to use the term "leftism" in a derogatory manner. Many leftists who paradigmatically meet the definition of leftism given in this text (for example, many anarcho-socialists, autonomists, anti-capitalists, insurrectionists, situationists, anarcho-primitivists, Marxists, etc.) often tend to criticize something they call "leftism". , implying that they do not recognize themselves as what they actually are: *leftists* in turn. To identify leftists one has to look at their core values, their ideals, their goals, their ideological references and ascent, etc., and not only if they express explicitly and seemingly rejection of "leftism" in their speech.

Presentation of “BEYOND THE CLIMATE CRISIS”

The value that we see in the following article lies in the fact that its author, starting from a critique of the way in which the issue of climate change is normally being approached, reaches the conclusion that the fundamental problem is the techno-industrial society (what she calls the “industrial consumer society”).

Unfortunately, however, Crist claims to have as his intellectual reference the pompous and misleadingly named “Critical Theory” (also known as the “Frankfurt School”), a heterodox branch of Marxism that has had an enormous influence on contemporary postmodern leftism. To what extent it is true that the author’s thought is really influenced in general by this group of late-Marxist philosophers is not clear. Perhaps the author is just trying to win over her editors (the magazine *Telos* in which this text was published does show unmistakable signs of being heavily influenced by the —Frankfurt School“). This, among other bad things, leads him to unnecessarily complicate the exposition of his arguments, sometimes adopting an abstruse, unconventional and unfortunate style, terminology and expressions (such as the use of the expression “instrumental rationality”, for example) and to confuse the social system or society, in general, with the mere social organization and ideology, in particular (that is, to confuse the whole of a society or culture with its mere political and economic subsystems and/or with its mere culture not material).

Even leaving aside the disastrous and unnecessary reference to the “Frankfurt School”, the author generally has a tendency to overcomplicate the exposition of her arguments, perhaps seeking in this way to give an appearance of greater “intellectual respectability”, which in the end results in an obscuration of the arguments that diverts attention from them and makes it difficult to understand them. A clear example of this would be the reference to the supposed “internal relationship between idea and context” by Peter Winch. Is it so difficult to simply say that there are terms that are loaded with a meaning or values because they have conventionally been used associated with said meaning and values and that, therefore, when they are used, even if it is intended to be used with other meanings and values? different, normally continue to promote that sense and those conventional values? Is it so difficult to simply say that there are terms and expressions that tend to be used mainly by certain types of people and in certain contexts and that, therefore, when they are used, even outside those environments, it is inevitable that the public associates them with they? For example, is it so difficult to say that, since the term “Anthropocene” has been

normally used by people who wish to justify the total domestication of the planet, it is commonly associated with such attempts at justification and that, therefore, using it tends to reinforce them? , even if it is intended to be morally neutral and merely descriptive? With so much snobbery, the author ironically ends up falling into a kind of anti-postmodern postmodernism, most petulant and ridiculous.

Nor is the author very successful when referring to the alleged "fatalism" of the promoters of geoengineering. Like many other people, he confuses —fatalism" (considering that nothing can be done to change the course of future events) and —determinism" (considering that all events are determined by previous events). The second does not always imply the first.

Finally, the author, like many other radical people who come to realize that the fundamental problem is the existence of techno-industrial society, falls into the error of speaking of "alternatives to the dominant order", when there are good reasons to think that what is really effective would be to try to destroy the current society without further ado, and that it is useless or even counterproductive to dedicate oneself to planning, and even more so to trying to carry out, alternative social models that replace it.

BEYOND THE CLIMATE CRISIS: A CRITIQUE OF THE CLIMATE CHANGE DISCOURSE

By Eileen Crist[a]

The dominant framework of climate change

Since we entered the 21st century, advances in knowledge and models of climate change, together with observable and measurable climate effects, have transformed the understanding of anthropogenic climate change into solid epistemic and experimental ground. There is no longer even the slightest hint of doubt about the reality of global warming, its causes and the climate change it has caused and predicts.¹

However, although climate change has left the realm of hypotheses to enter the realm of facts, uncertainties about its potential consequences are legion. As political scientist Karen Litfin points out, —uncertainties revolve around *when* and *to what degree* the projected climate [change] will occur, not about *yes* climate change will occur." Indeed, the predictions suggested in scientific journals, political reports, and popular books are largely limited by qualifications of possibility or probability. Consider, for example, the predicted measurable ranges for rates of carbon dioxide increase, temperature increase, sea level rise, hurricane frequency, changes in ocean acidity, or changes in precipitation

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

patterns (say, by the year 2050). The complexity in predicting weather and climate patterns, coupled with the difficulties in forecasting how humanity will respond over the next decade and beyond, have led to scenarios of climate change ranging from the controllable to the catastrophic.

Beneath many of the uncertainties lies an immense unknown: somewhere between manageable and catastrophic climate change, there are “tipping points” that no one can say with certainty or say have not yet been passed. Tipping points refer to climatic thresholds beyond which changes (such as extreme warming, sea level rise, or others) would be unleashed that we would not be able to resist or reverse. Science popularizer Eugene Linden uses the “switch” metaphor to express the idea of critical points. — Although we have been trying to console ourselves by believing that climate change is like turning to Translation by Último Reducto de —Beyond the Climate Crisis: A Critique of Climate Change Discourse”. Original published in *Telos* 141 (Winter 2007): 29-55. [<http://www.telospress.com>][www.telospress.com]. *N. of t. a dial*,” he explains, —the truth is that changes in the weather are more like flipping a switch.”

The looming tipping points have occupied the minds of those informed enough to understand that the consequences of breaching them - such as having to redraw the world’s maps or the large-scale collapse of societies - are real possibilities that demand preventive action. . The fact that events are happening faster than anticipated (for example, melting glaciers and ice caps or carbon release from forests and permafrost[b]) has only added stridency to urgent requests. The more greenhouse gases continue to be released into the atmosphere, the more likely the worst-case scenarios will materialize. This inference is based on the best available science about climate change - especially what we know about the correlation between carbon dioxide levels and temperature, as well as what has been inferred from the geological record about other previous episodes of climatic disturbances. It is therefore not surprising that writings about climate change, as well as a growing campaign to slow it down, exhibit a tone of urgency that exceeds even the alarming predictions of 1970s environmental thinking about “limits to growth.” . While the limits-to-growth paradigm warned that the world was doomed to collapse due to depletion of the resources necessary for human life, the climate change discourse envisages a large-scale crash because sinkholes are so saturated that are unable to absorb the waste of industrial civilization.

The increasing probability of worst-case scenarios materializing - if business as usual continues - has reinforced a specific framing for climate change: its identification as *the most urgent environmental problem of our time*. Consider some prominent examples in the current literature. In a widely read essay, Michel Shellenberger and Ted Nordhaus proclaimed “the death of environmentalism” on the grounds that the environmental movement and its professional representatives had failed to prevent “the world’s most serious ecological crisis,” global warming. In her manifesto for individualist activism, *The Solution is You*, Laurie David states that —global warming is threatening this fragile shell [i.e., the atmosphere] and has now become the most urgent of the times in which we live. —We are at the end of the rope, and the rope, whose braid determines

our destiny, is about to break”, warns James Lovelock in his latest work. “Humanity,” he tells us in relation to climate change, “is facing its greatest test.”[1154] Throughout this book, Lovelock argues that “global warming”[c] (as he prefers to call global warming) is threatening civilization itself.

Tim Flannery agrees with him. —If humans continue to do business as usual for the first half of this century,” he says, —I think the collapse of civilization due to climate change will be inevitable.”[1155] Ross Gelbspan made the same prediction even earlier: —[T]he complicated fabric of interrelationships that constitute society would be devastated in proportion to the magnitude of the disturbances. ... [S]uch a blow to our highly complex institutions ... would mean that all the achievements of our civilization to date would basically cease to make sense.”² In a similar vein, Al Gore issues alarming warnings about the worst potential catastrophe in the history of human civilization: a global climate crisis that is deepening and rapidly becoming more dangerous than anything we’ve ever faced. ever”.³ In his latest book, Bill McKibben echoes the dominant framework that presents climate change as *the* main problem of our time, calling it “the biggest problem facing the world”.⁴ NASA scientist James Hansen strikes a similar tone throughout his writings, such as when he writes: — The scientific theory [of global warming] taking hold reveals an imminent planetary emergency. We are at a critical point for the planet.”⁵

Consequences of the Dominant Framework

Although the dangers of climate change are real, I argue that presenting it as the most urgent problem we face carries even greater dangers. This way of framing climate change deserves to be questioned for two reasons: first, because it promotes the restriction of the proposed solutions to the technical field, by strongly insinuating that the necessary approaches are those that attack the problem directly; and, second, because it diverts attention from the ecological problems of the planet taken as a whole, by claiming all the prominence for a single issue that eclipses all the others.

² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

³ Examples:

⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

⁵ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “...it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

Labeling climate change as the greatest threat to civilization and placing it at the center of the fore as the problem of the highest priority, has fueled the proliferation of technical proposals that address the specific challenge. A race has begun to find out which technologies, or which branches of them, will solve —the problem”. It does not matter whether what is proposed is to revive nuclear energy, promote the installation of wind turbines, use various renewable energies, increase the efficiency of the use of fossil fuels, develop technologies to sequester carbon or place mirrors in space to attenuate the sun’s rays , the narrow-minded nature of such proposals is obvious: to tackle the problem of greenhouse gas emissions by phasing out, replacing or capturing them or by mitigating their thermal effects.

In *The Revenge of Gaia*, for example, Lovelock briefly mentions the need to address climate change—completely changing our way of life.”⁶ However, the key idea of this work, what readers and politicians have taken from it, is his repeated and strident calls to increase investment in nuclear energy, which he considers, in his own words, —the only lifeline that we can use immediately.”⁷ In the field of politics, it is often considered that the first step to fix global warming is to implement the Kyoto protocol. Biologist Tim Flannery campaigns for the treaty, comparing the need for its successful adoption to the Montreal Protocol, which phased out ozone-destroying CFCs. —The Montreal Protocol”, he assures, —marked a historic milestone in the development of human society, representing the first victory ever achieved by humanity in the face of a global pollution problem”.⁸ He hopes to achieve a similar victory in the case of the problem of climate change.

However, the growing understanding of the threat posed by climate change, practically following in the wake of the destruction of stratospheric ozone, also suggests that tackling global problems through one-off treaties is not the solution to the planet’s problems. Just as the risks of unforeseen ozone destruction have been followed by the dangers of a long-running and largely unnoticed climate crisis, it would be naive not to foresee that another (perhaps even completely unpredictable) catastrophe will follow the (expected) resolution of the other two mentioned. Furthermore, if greenhouse gases were successfully limited through technological transformations and innovations, the

⁶ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*]< em>, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

⁸ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

root cause of the entire ecological crisis would remain unaddressed. Destructive patterns of production, trade, extraction, land use, waste proliferation, and consumption, along with population growth, would go unchallenged and continue to deplete Earth's beauty and biological richness.

The industrial consumer society has consolidated a way of life that admits practically no limits to its capacity to, nor to its supposed right to, expand over the entire planet.⁹ However, in general, the questioning of this civilization is left aside in the discourse on climate change, with its determined search for a techno-solution to global warming.¹⁰ Rather than confront the forms of social organization that are causing the climate crisis - among multiple other catastrophes - the climate change literature often focuses on how global warming is endangering *the culprit*, and she agonizes over what technological means could save her from the impending tipping points.¹¹

The dominant climate change framework channels cognitive and pragmatic work to address global warming specifically, silencing a multitude of equally dire issues. Climate change looms so large on today's environmental and political agendas that it has contributed to downplaying other facets of the ecological crisis: the mass extinction of species, the devastation of the oceans by industrial fishing, the persistent deforestation of primary forests, the loss of soil and desertification, hormonal disorders, incessant development, etc. they are made to seem like secondary and minor problems compared to "dangerous anthropogenic interference" in the weather system.

In the remainder of this article, I am going to focus specifically on how the discourse on climate change encourages the permanent marginalization of the biodiversity crisis - a crisis that has been soberly described as a holocaust¹² and that, despite decades of scientific and environmental claims, it remains largely untaken seriously by society, the media, the humanistic literature, and other academic literatures. Several papers on climate change (but by no means all of them) examine extensively the consequences for

⁹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

¹⁰ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

¹¹ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

¹² "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

biodiversity of global warming¹³, but it is rarely mentioned that biodegradation[d] was earlier, by several decades, centuries or even more , to the dangerous accumulation of greenhouse gases and that will not be stopped even if global warming is technologically resolved. Climate change threatens to exacerbate the loss of species and ecosystems - in fact, it is already doing so today. However, while technological avoidance of the worst consequences of climate change may temporarily prevent some of these losses, such a solution to the climate dilemma will not stop the destruction of life on Earth that is already taking place - and will hardly take account of it.

Digression on the destruction of biodiversity independent of climate change

[d] —Biodepletion” in the original. *N. of t.*

The decline in the richness of life began with the exodus of hunter-gatherers from Africa thousands of years ago, and worsened with the invention of agriculture and cities, the development of warfare, and the advent of great voyages. exploration of the Europeans.¹⁴ But biodegradation accelerated enormously after the rise of industrial civilization, and especially from the mid-20th century, with billions of people not only doubling in number every few decades, but also leaning - compulsorily, voluntarily, or illusoryly - towards a consumer culture founded on overproduction and global trade. Overproduction and global trade, in turn, require the relentless conversion of living beings and natural systems into dead objects—resources—and into humanized landscapes and seascapes.¹⁵

The extinction caused by human beings can never be given enough importance, since it not only implies the death of the species, but also the end of their evolutionary destinies -of the forms of life to which they would have or could have given birth. place. The current extinction is not about species that disappear sporadically; it is a global and growing spasm of mass loss that the geological record reveals is a rare event in Earth’s natural history. Despite the shallow sophistry out there claiming that extinction is ”natural” or ”normal,” man-made extinction is not natural (since countless species are disappearing, either because of direct attacks or because the pressures to which they are subjected exceed their ability to adapt) or normal (since this level of loss occurs only rarely as a result of catastrophic events).

However, as tragic as extinction is, species are also being devastated without being wiped out: individual population losses and plummeting numbers are a severe blow to vigour, ecological contribution, connectivity and the evolutionary potential of the species. Today, declines of 70, 80, and 90 percent or more in the numbers of wild plants

¹³ Page 114.

¹⁴ “Chipmunks” in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

¹⁵ “Deadfalls” in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

and wild animals are common, both on land and in the oceans. These declines mean that species survive as relics, with their lifespans shortened or doomed to extinction, no longer capable of playing significant ecological and evolutionary roles.

The plummeting abundance of wild plants and animals brings to the fore yet another facet of biodegradation: the simplification of ecosystems. From a landscape point of view, the decline in the population and the number of geographic races of wild organisms means the constriction of their former distribution areas. As populations disappear from different places, their local contributions are lost; the losses reverberate through the communities of organisms to which the extinct organisms belonged, leaving behind degraded ecosystems. Although the simplification of ecosystems is often drastically visible, it can also take the form of a gradual and barely perceptible process. And it's not just that ecosystems, here and there, are occasionally suffering from simplification due to the loss of their local constituents. The biosphere everywhere is experiencing a huge reduction or elimination of areas that are, in some cases, centers of diversification - especially tropical forests, wetlands, mangroves and coral reefs.

The decline in ecological complexity is a global trend and is the result of the transformation of ecosystems for intensive human use, the aforementioned population annihilations, and the invasion of non-native species. Non-native species are generalists who stow away amidst the bustle of globalization - from fungi, which, favored by climate change, are killing frogs to the millions of domestic cats that prey on birds, among countless other examples.¹⁶ Human-facilitated invasions, along with the disappearance of native species, lead to places losing the constellation of life forms that once made them unique. The inevitable result of extinction, of collapsing populations, of the loss and simplification of ecosystems and of a biohomogenized world is not only the global demolition of wild nature, but also the arrest of speciation of much of complex life forms. The conditions for the birth of new species in a wide area of the spectrum of life, especially large species that reproduce slowly, have been suspended.¹⁷

All of these interconnected dimensions make up what conservation biologists refer to as the *biodiversity crisis*, a phrase that sounds like rhetoric to postmodernists, while the general public understands it (if they have even heard of it). heard something about it), largely in an uneducated and vague way, like —extinction.”[28] Leaving aside academic frivolity and public ignorance, the biodiversity crisis heralds a biospheric impoverishment that will be the situation in which all future human generations will have to live: between 5 and 10 million years are required for biodiversity to recover after a mass extinction of the scope of the current one. In view of this fact, I believe that unless global warming unleashes terrible hardships - in which case, the climate crisis and biodegradation would come together in one devastating event for virtually all of life¹⁸ - the implications of the impact Human impacts on biodiversity are so

¹⁶ “Sweat lodge” in the original. *N. from trans.*

¹⁷ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

¹⁸ “DNR” in the original. “Department of Natural Resources”. *N. from trans.*

extensive that they may actually make the impacts of climate change seem small by comparison.

And yet, the current climate change framework that presents it as *the* priority issue encourages the decommissioning of biodiversity to be viewed as less of a critical issue than the future repercussions of global warming. The attention that the long-term decimation of biodiversity that has been taking place for some time deserves is nullified in two ways in the climate change discourse: either it is suppressed by focusing on anthropocentric anxieties about how climate change will affect specifically to people and countries; or else biodegradation is presented as a corollary to climate change in writings that consider in detail how global warming will cause biodiversity losses. Climate change is undoubtedly accelerating the breakdown of the interconnections and variety of life. However, if global warming has such power to affect the natural world, it is because the latter's "immune system" had previously been severely weakened. Global warming is hitting *a natural world that was already badly hurt*. Taking into account the additional blow of climate change is important, but we should not focus on it at the cost of losing sight of other damage done to life on Earth independently of climate change, both prior to and concurrent with it.

Looking through the glass of climate change

Instead of focusing on global warming as the driver of further biodiversity loss, climate change can be seen as a mirror

[e] —Hitching rides" in the original. *N. of t.* that reflects how the ability of wild nature to adapt to changes in climate has been severely undermined. In other words, beyond intensifying the destruction of nature, climate change is exposing the violence that has already been perpetrated. There is a reason to look *through* climate change instead of *at* climate change: the reason is that climate change is not —the problem". The problem is an expanding civilization that is destroying the biosphere and will continue to do so even after overcoming (in one way or another) the main technical flaw: the consequences of the accumulation of greenhouse gases.

The biosphere has been hemorrhaging due to the transformation and destruction of habitats, the simplification of ecosystems, the fragmentation of the landscape, the massive killing of wildlife, industrial fishing, the invasion of exotic species and to chemical contamination. Climate change is the latest factor and is about to create a whole new level of consequences.¹⁹ For most of the species and ecosystems that are being and will be affected, climate change is less an additional factor than a *synergistic driver* of biodegradation. Scientist Camilo Mora and his colleagues, for example, have studied the synergistic adverse impact of different types of stress on life. They assert that habitat fragmentation, extraction and warming, taken separately, cause —deleterious

¹⁹ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

effects”, but that the synergies between these causes subject species to —greater risks of extinction than those predicted in the analyzes of each one of them. those threats.”²⁰

The intrinsic resilience of life in the face of environmental challenges - including some severe ones, such as climatic disturbances - has been so weakened that many species have been robbed of their ability to withstand them. According to conservation biologist Reed Noss, species can adapt to climate change in three ways: migration to suitable locations, phenotypic plasticity or acclimatization, and the development of adaptive traits. “The only other alternative,” he notes, “is decline and, ultimately, extinction.”²¹ Human impact has severely weakened all three species adaptation mechanisms in response to climate change.

Although species and ecosystems have faced changes in climate for as long as life has existed, they have never faced climate change on a planet dominated by *Homo sapiens*. The geological record reveals that life has been able to overcome climatic changes of the same range as the current one (so far).²² One crucial difference is that life then, unlike now, had many more degrees of freedom in which to move. Paleoecologists, when studying the reactions of species to previous climatic changes, have discovered that their habitual response has been to change distribution areas; different species move at different rates and in different directions, trying to keep track of their preferred climatic regimes. The key information from the fossil record is that species tend to move more individually than as ecosystem groupings, since each species has different “climatic environments” (ie needs and tolerances regarding climate). Ecosystems are dismantled as the constituent species of the communities separate and, although in the end they come back together in another place, they do so with new configurations.

The discovery of this pattern has been illuminating for understanding current trends and for predicting how things will develop during this century and the next. Today, the movement of species is blocked by cities, residential areas, rural settlements, agro-industrial landscapes, fences, highways and roads, airports, large shopping malls, and other artificially created environments. As species try to keep track of the climate regimes they need by moving around - a trend scientists are already seeing today[34] - there are fewer and fewer places they can go and more and more obstacles in their way. Such is the synergy of climate change in a world of transformed and fragmented landscapes. Severe limitations are predicted for biodiversity in terms of the ability of species to disperse and come together to form new ecologies. Thus, although scientists have found no evidence of large-scale mass extinctions during the important transitions

²⁰ “National forests” in the original. *N. from trans.*

²¹ “Buckskin” in the original. Name given especially to deer skins (“buck”) tanned without hair and with primitive techniques. *N. from trans.*

²² “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

between glacial and interglacial periods, they anticipate an avalanche of losses as a result of anthropogenic global warming - with potentially one million species becoming extinct. due to climate change during the 21st century[1156] - because of the interactive effect between rapid climate change and habitats becoming unavailable or degraded.

The mirror of climate change clearly reflects the extent to which wild nature[f] has been annihilated or constrained, especially in recent centuries. Accessible and productive wilderness and waterways have rarely been spared conversion or exploitation. Wilderness has been allowed to continue to exist in hard-to-reach areas, such as mountain ranges; in places too cold and desolate for extensive human habitation, such as the tundra and the poles; in the depths of the seas, as far as they remain unexplored; and in protected natural areas where intensive human activity has been prohibited.[36]

Since climate change entered the scene, *all of them have become endangered or threatened*. As far as mountains are concerned, Flannery notes that “nothing in predictive climate science is more certain than the extinction of many of the world’s mountain-dwelling species.”²³ Mountain ecosystems are not only unique in their own right, but have also served as refuges for species away from overexploited valleys. However, life in the mountains is in trouble, for as species move up the slopes in response to climate change, their territory becomes smaller and smaller, eventually disappearing.[38] The Arctic and Antarctic are also among the last wild places[g] and their landscapes and fauna are being decimated by the chimneys and exhaust pipes of civilization.²⁴ The ocean depths may be home to the wildest places left on the planet, with their virtually unexplored repertoire of creatures. However, not even the inhospitable depths are safe from climate change.[40] The fate of parks and reserves is similar throughout the world²⁵, with protected areas losing, or in danger of losing, species and habitats. The edges of natural parks cannot keep them safe from the new climate: animals and plants trying to move elsewhere are likely to find that the boundaries drawn around their homes do not mark refuges but traps.

What remains of the wilderness is either too inaccessible for humans to transform or has been set aside as a reminder of nature’s free state. In 1990, philosopher Tom Birch wrote an essay titled —The Incarceration of Wildness: Wilderness Areas as Prisons” in which he described protected nature reserves as similar to the reserves in which settlers corralled indigenous peoples. Aside from being theoretically shocking, this argument is being seen to be empirically prophetic.⁴² In its form of “Dr. Jekyll”, society has granted some havens to the wild, and yet, in the same project, —Mr. Hyde” has dedicated himself to imprisoning life. Both the non-human world and ourselves are about to pay the cost of the paradoxical enterprise of imprisoning wild nature: species will be hard pressed to cope with global warming by moving up into the mountains, north, into the depths in the seas or outside the parks. The mirror of climate change makes it

²³ “Between villages there is a death zone” in the original. *N. from t.*

²⁴ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

²⁵ 1 mile is approximately 1.6 km. *N. from t.*

extraordinarily visible, if it wasn't already, that wilderness can no longer exist as a few scattered, disconnected places - and that any enduring idea of sufficiently protected or sufficiently protected habitats remote enough to be safe from serious attacks is a 43 mirage.

Migration is the most important mechanism of adaptation of species in response to climate change and I have already discussed the ways in which it has been undermined. However, there are two more ways that species adapt: through phenotypic plasticity and through the development of new traits. Phenotypic plasticity refers to the ability of individuals of different species to acclimatize to new circumstances: to cooler or warmer weather conditions, to changing seasons and phenological changes, to new hydrological regimes or to a different diet. There are two limitations to the plasticity of species in dealing with global warming, and both have to do with human impact. One is that the faster the rate of environmental change, the more threatened is the adaptive capacity of organisms. Anthropogenic climate change is happening faster than past climate change episodes - much faster than many species are or will be able to withstand. The second limitation has to do with the kinds of species that exhibit phenotypic plasticity—and, of course, these are the generalists, or pest species, that modern civilization has already been fostering. Climate change is expected to further promote them: they will simply adapt better to changing conditions, colonize emerging niches more readily, and outcompete specialists in their own former homes for habitats.[44]

Not only has distributional change in response to climate change been made more difficult by the ways in which landscapes have been modified, and not only have specialists in particular habitats been threatened by rapid climate change and put at a disadvantage compared to generalists. Also the potential for genetic adaptations - through the selection of better adapted varieties - has been undermined. In certain cases, genetic changes will undoubtedly occur as a result of climate change.²⁶ However, the reduction in population numbers and sizes (already discussed) that has been imposed on wild species is forcing them to face the challenge of a new climate with diminished genetic resources. As scientists Thomas Lovejoy and Lee Hannah explain in the final part of their book *Climate Change and Biodiversity*, —small and fragmented populations reduce the pool of individuals capable of responding rapidly to climate change or completely eliminate genetic variations that enable a rapid response.”²⁷

In summary, the adaptive responses of species to climate change -changes in distribution, acclimatization and genetic change- have been seen, either flawed, or disabled. The impact of global warming on the natural world can therefore be compared to the attack of a pathogen suffered by an organism with a weakened immune system. Nature is highly vulnerable to climate change - and would remain so even if this episode of

²⁶ “Wilderness” in the original. This term refers to lands and ecosystems that are little or not at all humanized. Depending on the context, it can be translated in various ways: “wild lands”, “wild territories”, “wild areas”, “wild ecosystems” or, more generally, “wild nature”. In this text it has been translated as “wild nature” except in cases where it is explicitly indicated otherwise. *N. of t.*

²⁷ “Wilderness” in the original. *N. of t.*

climate change were not man-made - due to the patterns that modern humans have imposed on landscapes and the ways in which the diversity of life has already been reduced. To quote ecologist Alan Pounds: Climate change is a bullet that threatens to wipe out many species and ecosystems, but the consumer industrial civilization is pulling the trigger.²⁸

Climate change as apocalypse and the emergence of geoengineering proposals

The knowledge that biodiversity is in serious trouble has been available for at least three decades, yet this momentous event has never inspired the same urgency that climate change has unleashed in a handful of years. This appears to be a blatant manifestation of anthropocentrism (the *idée fixe* that human interests, including short-term and non-vital ones, always come before those of other beings), as that climate change is perceived as threatening people *directly* - like the heat wave that hit Europe in the summer of 2003, Hurricane Katrina and other examples of extreme weather. On the other hand, the loss of diversity and abundance of life is not widely considered to pose any risk to human survival. After all, countless species, subspecies, ecosystems, populations of wildlife and wild flora, ancient forests and wetlands, etc. they have faded or shrunk and, to quote an anti-environmental cliché, have not yet “sunk in the sky”.

On the contrary, the dominant framework of climate change - the identification of it as the most urgent problem we face - does nothing more than openly declare that the sky is falling. The apocalyptic potential of global warming in the not-too-distant future manifests itself in a much more vivid way than a mere background between the lines of climate change writing. The difference between the characterizations of climate change as “the collapse of civilization” or “a planetary emergency” (cited above), on the one hand, and the idea of apocalypse, on the other, is almost purely semantic. Works on climate change do not use the *word* —apocalypse”, but often imply or overtly describe something that is curiously reminiscent of what religious imagery has portrayed as such. Ross Gelbspan, for example, in a truly typical description of what climate change heralds, writes of “the world’s transformation into an incubator for infectious diseases, a world plagued by insects and battered by storms,” a world “with extreme temperatures, extensive droughts and stifling heat.”²⁹

²⁸ “Wildness” in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply “wild nature”. Here, except where otherwise noted, it has been translated as “the wild character.” *N. of t.*

²⁹ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

The Revenge of Gaia may be the most overtly apocalyptic work on global warming in print. Lovelock considers that all the variables that affect the climate are interacting with positive feedbacks, which indicates, in his own words, that “any addition of heat from any source will be amplified”.³⁰ Among the positive feedbacks, he lists the loss of albedo due to melting polar ice, the decline in the amount of plankton that absorb carbon dioxide and produce clouds, and the release of methane trapped on land and (possibly) in the bottom of the ocean. sea - all of them are consequences of the increase in temperatures and, in turn, will act to reinforce and accelerate “global warming”. Any one of these feedbacks could be cause for concern, but taking them all together creates an alarming picture, according to Lovelock. This author predicts runaway warming: “Evidence from the world’s observatories,” he says, “brings news of an imminent shift in our climate to one that can easily be described as Hell: so hot and so deadly that only a handful of individuals among the several billion now alive.”³¹ This forecast is an elaboration of the idea of crossing Earth system thresholds and unleashing both fatal and uncontrollable consequences: in the climate change literature, crossing thresholds is referred to as “dangerous human interference.”

Although the concrete forecast of a Hell in which billions will perish ranks among the most extreme predictions of climate change, the vague hint of an impending calamity for large numbers of people, and for civilization itself, is pervasive in such literature. Both overt and implied, apocalyptic overtones abound in climate change discourse. The *concept* of the apocalypse is not just a household idea, but is something so current today (with fundamentalisms of all kinds and their ideas in full swing) that the explicit reference to a imminent apocalypse is redundant for readers of writings on climate change. Dire warnings about the consequences of continued use of fossil fuels, coupled with images of rising seas, increasing heat waves, raging forest fires, runaway disease and acidified oceans, are enough to vividly evoke a vision of the end of the world that Judeo-Christian culture has been circulating for two millennia.

Apocalyptic thinking manifests itself in a triple narrative structure regarding the exact moment in which they will occur, the nature they will have and the consequences that the expected events will bring if greenhouse gas emissions continue: one, it is predicted (or it is hinted) the arrival of a calamity that will destroy the Earth at a future time, although unspecified; two, it is dimly portrayed as a single monumental catastrophe (previously heralded, perhaps, by a series of interconnected minor catastrophes) that will affect everyone and everything; and three, it suggests that the survival and viability of civilization are at stake, with predicted unprecedented levels of death, suffering and social collapse.

Regardless of whether or not the doomsday warnings are predicting an immanent reality, and whether the world is *really* heading for the hellish heat and anomie that

³⁰ “Wilderness” in the original. *N. of t.*

³¹ “Rambunctious garden” in the original. It is an allusion to *Rambunctious Garden* which, as the author points out below, is the title of a book by Marris in which he defends the domestication and management of the Biosphere. *N. of t.*

Lovelock fears so much, climate change presented as apocalypse can be doomed by directly favor religious fundamentalisms that threaten the world. In fact, the apocalyptic narratives in the climate change literature come very close to the prophetic proclamations that abound in both the Old and New Testaments.³² One perverse consequence of the similarity between climate change and biblical imageries is noteworthy: many fundamentalists (politicians, officials or citizens) may well remain indifferent and undaunted by warnings about climate change, which do nothing more than reaffirm their visions of the end of the world, on the one hand, and of the second coming, on the other. As Derrick Jensen observes about this disturbing element in force today, —for many fundamentalists, the murder of the planet is not something to be avoided, but rather encouraged, since it accelerates God’s victory over all things earthly”.[52] Doomsday warnings fit the doomsday fantasies of those who seem to care little about the fate of the biosphere; and while their fantasies may not be widely accepted beliefs, they do have some *de facto* credibility due to their enormous cultural ubiquity.[53,h]

The narrative affinity with biblical accounts is the least problematic of the aspects of depicting the climate crisis as an apocalypse in the near future. The most pernicious dimension of this representation is that of eclipsing the reality in which we find ourselves immersed *here and now* (and in which we have been immersed for a long time) —namely, the simplification and the homogenization of life on Earth. Climate change is not causing, but accelerating, the decline of the planet, and even if the technological grail were to finally solve the climate crisis, it would, in all likelihood, simply allow the dismantling of the biosphere to continue.

In addition to fostering humanity’s tendency to self-center its concern, apocalyptic thinking directs its attention to some kind of future Hollywood cataclysm, while numbing awareness of the present and real suffering of non-human beings, of people dispossessed and impoverished and consumers wracked with confusion and discomfort. The ongoing devastation of life and the pathological imbalance of humanity with respect to wild nature, together with the splits within itself, are the problems we are called to face —not the prediction of some imaginary disaster in some imaginary future.

Given the dominant framework of climate change, it is hardly surprising that so-called “geoengineering” (or, in even more Orwellian parlance, —radiation management) projects are increasingly touted as reasonable solutions to the climate crisis; it would be equally unsurprising if, before long, they were promoted as inevitable. A recent article in *Nature* states that given—the need for drastic approaches in order to avoid the effects of rising global temperatures...it seems likely that curiosity about the geoengineering.”³³ Six months earlier, an article in *Wired* gushed about the prospects, assuring us that—thankfully, a growing number of scientists are thinking more aggressively, coming up

³² “Breakthrough Institute” in the original. *N. of t.*

³³ “Untrammelled by man” in the original. It refers to a famous and controversial section of the US Wilderness Act (section 2c). *N. from t.*

with incredibly ambitious technical hacks to freshen up the planet.”³⁴ Lagging behind apocalyptic fears, geoengineering is easily presented as an idea whose time has come; the attentions that physicist Paul Crutzen has brought to geoengineering have imbued it with even greater credibility. Crutzen received the Nobel Prize for his work on the destruction of the ozone layer and is now carefully promoting “active scientific research” into the possibility of releasing SO₂ into the stratosphere, which, by converting it to sulfate particles, would mask the global warming through an effect known as global dimming; Crutzen calls it —stratospheric increase in albedo”.³⁵ In essence, this strategy promotes counteracting one type of contamination with another.

In a 1997 article in the *Wall Street Journal*, nuclear physicist Edward Teller was a decade ahead of the current environmental mainstream with a geoengineered solution to global warming. In fact, the invitation to carry out, if necessary, incredibly ambitious technical manipulations in order to cool the planet, which Teller posited as a rational and economically defensible enterprise, may, in retrospect, have pioneered the field of politics. It seems possible that the self-confident and measured message

[h] Here it is important to bear in mind that the author is from the United States and that Christian fundamentalists have significant social and political weight in her country. *N. of t.* in dollars (and coinciding with the year of the Kyoto protocol) played a role in the reluctance of the current US administration to listen to calls to restrict emissions, since Teller confidently affirmed that if global warming were it to become dangerous, applying some ingenious engineering mega-trick³⁶] would be cheaper than abandoning the use of fossil fuels.³⁷

It would certainly be ironic if mainstream environmentalism was catching up to the solution promoted by Teller, and perhaps supported throughout the Bush administration. However, the irony is deeper than the politics of the day. The programmed rationality of a geoengineering solution, fueled by doomsday fears surrounding climate change, promises consequences (both physical and ideological) that will only hasten the true end of wilderness: —we find out here”, says Murray Bookchin, — the ironic perversity of a ‘pragmatism’ that is not different, in principle, from the problems it hopes to solve”.³⁸ Even if they work exactly as expected, geoengineering solutions are

³⁴ Secondary growth forests, or secondary forests, are forests that have grown again after being felled and that, after a sufficiently long period, are in the process of recovering, so that the effects of felling cease to be appreciable. Secondary forests are different from forests that regrow after natural disturbance (early serial forests), such as fire, pests, wind, etc. since they largely lack the nutrients, as well as the protection against erosion or the capacity to retain water in the soil that dead trees provide. *N. from t.*

³⁵ “America’s federally designated wilderness system” in the original. *N. of t.*

³⁶ —Mega-fix” in the original. *N. of the t.*

³⁷ There is a partial Spanish translation of “A Sandy County Almanac” in *An Earth Ethic*. Waterfall Books, 2005.

³⁸ Literally “Dust Bowl”, “Dust Bowl” is the name by which the phenomenon is known in English that in the 1930s affected the plains and prairies that stretch from the Gulf of Mexico to Canada. The soil, stripped of moisture, was blown up by the wind in great clouds of dust. The drought-resistant

much more akin to anthropogenic climate change than a counterforce to it: their implementation constitutes an experiment with the biosphere, backed by technological arrogance. , the reluctance to question or put limits on the consumer society and a sensation of having the right to metamorphose the planet that is amazing. It is, in fact, these three elements - techno-arrogance, reluctance to propose radical changes and unlimited rights -, together with the deep erosion of admiration for the planet that created life (and gave birth to us), that < em>constitutes the real apocalypse - if we want to call it that, although the words humanization, colonization or occupation of the biosphere are much more adequate to describe it. Once we understand the ecological crisis as the growing transformation of the planet into a "miserable place of transit"³⁹, it becomes clear that inducing "global dimming" to counteract "global warming" is not a corrective measure but another chapter in the project of colonization of the Earth, of what critical theorists called global domination.

Domination comes at an enormous cost to the human spirit, a cost that may or may not include the degree of risk and physical suffering that apocalyptic fears evoke. Human beings pay for domination of the biosphere - a domination to which they are either inclined or resigned - with alienation from the rest of life on Earth.⁴⁰ This alienation is manifested, first and foremost, in the invisibility of the biodiversity crisis: the constant denial and repression, in the public sphere, of the historic milestone of mass extinction and the accelerated destruction of the biological treasures of the Earth. It has taken the threat (to people and to civilisation) of climate change to allow the tip of the iceberg of biodegradation to surface in public discourse, but even this has been woefully inadequate in failing to recognize two crucial facts: first, that the biodiversity crisis has been going on regardless of climate change, and will hardly be stopped by windmills, nuclear power plants and carbon sequestration, whatever their quantity and however they combine with each other ; and, second, that it is the devastation that species and ecosystems have experienced to date that will largely allow even more damage associated with climate change to occur.

Human alienation from the biosphere is further manifested in the stubbornness of instrumental rationality, which reduces all challenges and problems to variables that can be controlled, repaired, managed or manipulated through technical means. Instrumental rationality is seldom questioned in any substantive way, except to highlight the potential "unintended consequences" (eg, of putting geoengineering technologies into practice). The idea that instrumental rationality (in the form of technological fixes for global warming) could fix things flutters between misrepresentation and delusion: first, because instrumental rationality has itself been the nemesis of the planet in mediating time to consider the biosphere as a resource and sanction the transformation of

grasses of the original prairie ecosystem were replaced by wheat crops that, failing due to drought, left the soil bare, creating dust storms of unprecedented magnitude. *N. from t.*

³⁹ There is a Spanish translation of "Thinking like a mountain" in *An Ethics of the Earth*. Cataract Books, 2005. *N. from t.*

⁴⁰ "Wildness" in the original. *N. from t.*

Homo sapiens into a user species; and, second, because instrumental rationality tends to invent, adjust and tweak the technical means so that they work in certain given contexts -when it is *the given*, that is, civilization, as it is configured economically and culturally in the present, what needs to be changed.

Against the Anthropocene

—Having struck the human hammer,” writes EO Wilson, —the sixth extinction has begun. It is expected that this wave of definitive losses will reach the level of the end of the Mesozoic by the end of this century, if no one remedies it. We will then have entered what both poets and scientists may call the Eremozoic Era - the Age of Solitude. We will have created it entirely ourselves and we will have done it while being aware of what was happening.”[61] In the modern Greek language —*eremo*” also means abandoned, empty: Eremozoic can also be translated as the —Era of the Void”. However, the name proposed by Wilson is not the one that has had the most hook. In its place, a recent academic fad heralds the coming of the Anthropocene—the Age of Man”—which is supposed to have replaced the Holocene that began at the end of the last ice age, some 11,000 years ago. The fact that —humanity’s activities” have grown to become —a significant geological and morphological force”, shaping even the parameters of the climate system today, is the justification offered for heralding the Anthropocene - going back even to the dawn of the Industrial Revolution.⁴¹

The term Eremozoic evokes the immensity of what is being lost and the desolation of the human existential condition in a retouched world in which everything returns the reflection of *anthropos*. The term Anthropocene, on the other hand, affirms what is becoming ubiquitous and inescapable: the ubiquitous mark of modern humanity, the civilizing frenzy of the productive age and its rage not to leave a single piece of land untransformed, for putting the seal of production on the whole.”⁴² Both —Eremozoic” and —Anthropocene” signify the inauguration of the same world; the fact that “Anthropocene” has been the prevailing term reflects the vanity that characterizes our species in its modern form. However, the effort to baptize the colonization of the biosphere with the name of —Anthropocene” serves, in a more consistent way, to strengthen its reality and its consequences.

Speaking and acting, as Peter Winch makes clear in a classic sociology text, are two sides of the same coin. We cannot be so naive as to pretend that talking about the Anthropocene is merely describing, because, in fact, it is also acting: said language anchors it and participates in its consolidation. —The idea takes its meaning from the role it plays in the system, explains Winch. —The relationship between the idea and the context is *internal*”.⁴³ To propose the use of the term —Anthropocene” as a

⁴¹ Norse. *N. from t.*

⁴² “Self-willed” in the original. *N. from t.*

⁴³ “Arctic National Wildlife Refuge” in original. *N. from t.*

description of reality (for which it is undoubtedly justified) is to deny responsibility for the way in which, in turn, the proposed concept *acts on* reality itself. a reality that it purports to be merely describing: reinforcing it, sharpening its contours, and finally, through the extraordinary power of language to turn the world into experience and meaning, legitimizing it. In short, proposing a concept of this magnitude does not simply reflect the state of things, but also amounts to materializing and affirming that state of things.

The linguistic acceptance of the Anthropocene conceptually reinforces the supposed rights of modern humanity, and therefore, reinforces the way in which human beings act within the biosphere; By virtue of the internal relationship between idea and context (identified by Winch), enunciating the Anthropocene further normalizes human interference in, and use of, all natural systems on the planet. Masquerading as realism, the declaration of the Anthropocene contributes to setting the course of history in the specific direction that the concept itself circumscribes. "Our idea of what belongs to the realm of reality is given to us by the language we use," Winch writes. —The concepts that we have establish for us the form of the experience that we have of the world".⁴⁴ This claim should not be confused with the simplistic notion that language "builds the world." Rather, Winch (like Wittgenstein in his later years, by whom he was influenced) asserts that concepts, actions, reality, and experience are so deeply intertwined with one another as to be mutually constitutive. When we speak we have to be attentive not only to what we are saying, but to what we are doing with what we say - to the world-shaping power of what we are saying.

Those who nonchalantly herald the Anthropocene in the halls of academia discursively stamp this outcome on history with the stamp of "inevitable" and stamp the death of the Holocene with the word "done." However, declaring the arrival of the Anthropocene and the end of the Holocene is arrogant and premature and should be unmasked for what it is: the consecration of the domination of the planet by humanity or, in the best of cases, a capitulation to fatalism.

To fatalistic thinking, the trajectory of the consumer industrial civilization seems to follow a course that humanity cannot abandon without derailing; it is taken for granted that, although the specifics of the future may elude us, in general (for better or worse) it follows a fixed direction of —more of the same". Fatalistic projections see the course of human history (and concomitantly that of natural history) as the inevitable outcome of the momentum of current trends. According to the fatalistic point of view,⁴⁵ current patterns of global economic expansion, increased consumption, population growth, transformation or exploitation of the land, killing of wildlife, extinction of species, chemical pollution, the devastation of the oceans, etc. will continue to occur, to a greater or lesser extent, by virtue of the inertia manifested by massive

⁴⁴ "Wildness" in the original. *N. from t.*

⁴⁵ "Wilderness" in the original. *N. from t.*

forces.⁴⁶ We see here what Horkheimer and Adorno had in mind when they pointed out that —logical necessity...remains tied to domination, both as a reflection and as a tool of it”.⁴⁷

In fact, fatalism is a mentality that reinforces the very tendencies that generate it by encouraging conformism with respect to said tendencies. The conformism that fatalism provokes is invisible to fatalistic thinkers themselves, who do not consider themselves conformists, but simply realists.⁴⁸ However, the conceptual and pragmatic fortification of the socioeconomic system by fatalistic reasoning is indisputable, emerging as an effect similar to what is called “positive feedback” in cybernetics,⁴⁹ “loop action” in philosophy⁵⁰ and — self-fulfilling prophecy” in sociology.⁵¹

The complicity of fatalism in maintaining the dominance of consumer industrial civilization deserves close scrutiny: fatalism may be the most powerful form of ideology there is. Ideology, as Jürgen Habermas succinctly recaptured the concept, “serves to prevent the foundations of society from becoming the object of thought and reflection.”⁵² The statement that we live in the Anthropocene (to continue with this key example) has the ideological effect of precluding deep questioning and dismissing even discussion of revolutionary action. Rather, we are indirectly warned, our destiny is to live out our days in the —Age of Modern Man“, in which we will have to get by and manage the world as best we can. Furthermore, the narrow and technical conception of climate change as “the problem” is indebted to that same fatalistic mentality. *The real problem* - the industrial-consumer complex that is transforming the world into an orgy of exploitation, overproduction and waste - is treated with kid gloves, taken for granted and considered to be beyond the reach of effective questioning.

However, this civilization is not beyond the reach of radical action - and it is certainly not beyond the reach of radical criticism.⁵³ If the price of —thinking in terms of alternatives to the dominant order [is] to risk exclusion from the right-thinking society[j]”, as social theorist Joel Novel observes about our times, then let us pay the price and preserve our clarity about of the irredeemable socioeconomic reality in which we live.⁵⁴

⁴⁶ *Idem. N. from t.*

⁴⁷ The author refers to the discovery of large geometric figures of earth (geoglyphs) in certain areas of the Amazon basin. See, for example, “Environmental impact of geometric earthwork construction in pre-Columbian Amazonia,” John Francis Carson, Bronwen S. Whitney, Francis E. Mayle, José Iriarte, Heiko Prümers, J. Daniel Soto, and Jennifer Watling, in PNAS, July 7, 2014. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>][<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115532/>]. *N. from t.*

⁴⁸ “Wilderness” in the original. *N. of t.*

⁴⁹ Genus *Megatherium*. *N. from t.*

⁵⁰ 1 foot = 30.48 cm. *N. from t.*

⁵¹ Rodents of the genus *Dipodomys*. *N. from t.*

⁵² *Ambystoma tigrinum*. *N. from t.*

⁵³ “Pleistocene rewilding” in the original. *N. from t.*

⁵⁴ “De-extinction” in the original. *N. of t.*

Grades:

1. Regarding the scientific consensus on climate change, see the seminal 2004 study by Naomi Orestes, —Beyond the Ivory Tower: The Scientific Consensus on Climate Change”, *Science* 306, n° 1686 (December 3, 2004). See also Bill McKibben’s popular article, —The Debate is Over: No Serious Scientist Doubts that Humans Are Warming Up the Planet,” *Rolling Stone*, November 3, 2005. Virtually every issue of *Science* and *Nature* for the last two years have contained an article about global warming. Scientific publications no longer defend the veracity of anthropogenic climate change, but, taking it for granted, report on its different dimensions. For an analysis of the persistent disconnect between the perception that the American public has about the existence of a ”debate” about the existence of climate change and the real status that scientists grant to climate change, see the text by Eugene Linden , —The Tides of Public Opinion,” in Chapter 18 of *Winds of Change: Climate, Weather, and the Destruction of Civilizations* (New York: Simon & Schuster, 2006), pp. 219-29.

2 .Karen Litfin, —Environment, Wealth, and Authority: Global Climate Change and Emerging Modes of Legitimation”, *International Studies Review* 2, no. 2 (Summer 2000): 136 (italics in original).

3 .For an updated summary of climate change science data, see the 2007 report of the Intergovernmental Panel on Climate Change (IPCC)[k], —Climate Change 2007: The Physical Science Basis: Summary for Policymakers”, available —online” at the IPCC web page, [<http://www.ipcc.ch/>][<http://www.ipcc.ch/>]. I will not quote data

[j] ”Polite” in the original. *N. of the t.*

[k]—Intergovernmental Panel on Climate Change (IPCC)” in the original. *T.N.* quantitative in this text, since they are not directly relevant to my argument. Tim Flannery does an excellent job on *The Weather Makers: How Man is Changing the Climate and What it Means for Life on Earth*⁵⁵ (New York: Grove Press, 2005) on the hour to integrate quantitative predictions. This book is possibly the most comprehensive work on climate change to date. Many of the most recent discussions and controversies revolve around the predictions of the rise in sea levels; see, for example, Richard Kerr, —A Worrying Trend of Less Ice, Higher Seas,” *Science* 311 , no. 5768 (2006 Mar 24): 1698-1701; and Stefan Rahmstorf, —A Semi-Empirical Approach to Projecting Future Sea-Level Rise,” *Science* 315, no. 5810 (January 19, 2007): 36870. James Hansen has challenged the projections of the 2007 IPCC about sea level rise considering that they are potentially underestimates that will “encourage the public to respond in a predictable way as if the projected change in sea level were to be moderate” and warns of the — danger of being overly cautious” when making forecasts in the science of climate change. Hansen, —Scientific Reticence and Sea Level Rise”, *Environmental Research Letters* 2 (April-June 2007): 1 and 4.

⁵⁵ There is an edition in Spanish: *The Weathermakers. The Threat of Climate Change*, Editorial Taurus, 2006. *N of the t.*

4 .The critical point concept is linked to the emerging understanding of the non-linear nature of a forced climate, which implies that once a threshold (or thresholds) is (are) crossed, conditions jump to new states (possibly hostile) after a period of chaos or disturbance. The "tipping point" largely implies a causal variable, namely: a threshold carbon load in the atmosphere (impossible to specify), beyond which gigantic and unstoppable consequences are assured. Climate models or theoretical speculations abound that show what those potential consequences are. The possible interruption of the "thermohaline circulation" (a branch of which is better known as the Gulf Stream) and when this might occur receive wide attention. Unmanageable sea level and runaway warming are also some of the possible consequences of overshooting tipping points. More recently, the destruction of the Amazon rainforest has been predicted as a potential result of climate change. In her work, *Field Notes from a Catastrophe: Man, Nature, and Climate Change*[m] (New York: Bloomsbury, 2006), Elizabeth Kolbert quotes a glaciologist explaining the tipping point using an image poignant: "You can get to the point and then you'll just back off." You can get to it and go back. And then you get to it and go to the other stable state, which is completely upside down" (p. 34).

5 .Linden, *Winds of Change*, p. 31.

6 .—"If we push the weather system hard enough, it may gain momentum," warns Hansen, —it may surpass critical points, so that climate changes continue, without control on our part. Unless we start to rein in the forces created by humans, there is a danger that we will create a different planet, one far removed from the range that has existed throughout the course of human history." James Hansen, —Political Interference with Government Climate Change Science," testimony before the Commission on Oversight and Government Reform[n], United States House of Representatives[o], March 19, 2007, p. 10. Available —online" at:

[<http://oversight.house.gov/documents/20070319105800-43018.pdf>][<http://oversight.house.gov/documents/20070319105800-43018.pdf>].

7.Classic works on limits to growth are *Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*[p] by Donella Meadows *et al.* (New York: Universe Books, 1972) and *The Population Bomb*[q] by Paul Ehrlich (New York: Ballantine, 1971), which predicted that events of catastrophic depletion of non-renewable resources and of exceeding carrying capacity by the human population would occur within a few decades. The appearance of the destruction of the ozone layer and global warming in the 1980s and 1990s contributed to changing the ecological discourse away from fears of exceeding the resource base towards the consequences of the collapse or imbalance of the Earth system. caused by exceeding the capacity of the planet's sinks to absorb global waste products.

8. Michael Shellenberger and Ted Nordhaus, —The Death of Environmentalism," September 29, 2004, p. 6. Available —online" on the Heartland Institute —web" page: [<http://www.heartland.org/Article.cfm?artId=16188>][<http://www.heartland.org/Article.cfm?artId=16188>].

9. Laurie David, *The Solution is You! An Activist's Guide* (Golden, CO: Fulcrum, 2006), p. two.
10. James Lovelock, *The Revenge of Gaia: Earth's Climate in Crisis and the Fate of Humanity* (London: Penguin, 2006)[r], pp. 146 and 6.
11. Flannery, *The Weather Makers*, p. 209.
12. Ross Gelbspan, *The Heat is On: The Climate Crisis, the Cover-Up, the Prescription* (Reading, MA: Perseus, 1998), p. 173.
13. Al Gore, *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*[1159]⁵⁶ (Emmaus, PA: Rodale, 2006), p. 10.
14. Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future* (New York: Times Books, 2007), p. twenty.
15. James Hansen, —State of the Wild: Perspective of a Climatologist,” in prep. Available *online* at:
[\[http://www.giss.nasa.gov/~jhansen/preprints/Wild.070410.pdf\]](http://www.giss.nasa.gov/~jhansen/preprints/Wild.070410.pdf)[\[http://www.giss.nasa.gov/~jhansen/preprints/Wild.070410.pdf\]](http://www.giss.nasa.gov/~jhansen/preprints/Wild.070410.pdf).
16. Lovelock, *The Revenge of Gaia*, p. eleven.
17. *Ibid.*
18. Flannery, *The Weather Makers*, p. 220.
19. Throughout this paper I use the conceptual shortcut —industrial consumer civilization” as a target of social criticism. This expression reflects the influence of the Frankfurt School on my thought, especially that of the critical theorists Theodor Adorno, Max Horkheimer, and Herbert Marcuse. These thinkers elaborated and substantially revised Marx’s analysis of capitalism as a mode of production, adding to it the dimension of capitalism as culture, as a way of life. Capitalist production, along with the sociocultural patterns and ideologies of consumerism, are complicit in the destruction of nature and the alienation of social relations. Production and consumption, in other words, constitute a single, literally totalitarian way of life, in which the social division into groups of —rulers” and —ruled”, —perpetrators” and —victims”, has become shaky when not absurd. As Marcuse pointed out in his 1964 work, more current than ever, the totality of sociocultural and economic life - from the (real or desired) forms of food and housing, to transportation, passing through entertainment or the way of feeling and to think- —unites, more or less pleasantly, the consumers with the producers and, through the latter, with the totality”. Herbert Marcuse, *OneDimensional Man: Studies in the Ideology of Advanced Industrial Society*[t] (Boston: Beacon, 1991), p. 12. Horkheimer and Adorno traced the origins of the collective’s participation in their own domination up to the “historical” moment when magical control over nature (and nature deities) was placed in the hands of an elite or specific minority in exchange for their own and social preservation. Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment*[u], trans. John Cumming (New York: Continuum, 1972),

⁵⁶ There is a Spanish translation: *An uncomfortable truth: the planetary crisis of global warming and how to deal with it*, Gedisa, 2009. *N. from t.*

pp. 21-22. After this decisive turn in which the social body was involved in its own domination, —what a few do to all, always happens as the submission of individuals by the majority: social repression always shows the mask of repression by a group” (*ibid.*). And in another place: —The lost love of common people for the evil that is done to them has more strength than the ingenuity of the authorities” (*ibid.*, p. 134). In the face of such astute observations by critical theorists, neo-Marxist and anarchist analyzes that blame corporate and/or state power for the problems of the natural and social worlds are, at best, mere partially true.

20. More than thirty years ago, the environmental philosopher Arne Naess made the influential distinction between “shallow” and “deep” ecologies, which are characterized, respectively, by focusing on the symptoms of the environmental crisis and paying critical attention to the underlying causes behind those symptoms. Despite its unfortunate elitist background—which meant that some environmental thinkers were capable of deep reflection while others were left to discuss trivia—the distinction between shallow and deep ecology has been important for two compelling reasons. One, he clarified how the study of “symptomatology” leads merely to piecemeal technical solutions; and two, it showed how, if left untreated, the underlying causes end up generating more unpleasant symptoms. In other words, superficial ecological thinking is technical and narrow-minded: when we think about climate change as “the problem” - instead of confronting the unlimited expansionism of capitalist enterprise as the cause of the problem - we are surely being superficial in Our thinking. Arne Naess, —The Shallow and the Deep, Long-Range Ecology

[t] There are several editions in Spanish. For example: *The One-Dimensional Man*, Ariel, 2010. *N. del t.* [u] There is a Spanish edition: *Dialectic of Illustration*, Akal, 2007. *N. of t.*

Movements”, in George Sessions, ed., *Deep Ecology for the Twenty-First Century* (1973; Boston: Shambhala, 1995), pp. 151-55.

21. As environmental writer Derrick Jensen points out about this kind of reasoning, it ends up “arguing about the techniques needed to save civilization, not about ways to save the planet.” *Endgame*, vol. 2, *Resistance* (New York: Seven Stories Press, 2006), p. 757.

22. EO Wilson, *The Diversity of Life*[v] (New York: Norton, 1999), p. 259.

23. I am referring here to writings on climate change in general that include important sections on biodiversity, not to works that focus *specifically* on biodiversity in relation to climate change. In *The Weather Makers*, Flannery examines the impact of global warming on life. In his prescient book, McKibben also devoted considerable attention to the fate of species and ecosystems in relation to global warming. See Bill McKibben, *The End of Nature*[w] (New York: Random House, 1989). In his book *Laboratory Earth: The Planetary Gamble We Can’t Afford to Lose* (New York: Basic Books, 1997), climate scientist Stephen Schneider has a chapter on the effects of climate change on biodiversity. Recently, Hansen and his colleagues have proposed two criteria for considering climate change “dangerous”: rising sea levels and the extermination of

species. See James Hansen *et al.*, —Global Temperature Change,” *PNAS* 103, no. 39 (26 September 2006): 14288-93. For the most comprehensive volume to date dealing specifically with the impact of climate change on biodiversity, see Thomas Lovejoy and Lee Hannah, eds., *Climate Change and Biodiversity* (New Haven, CT :Yale UP, 2005).

24. See David Burney and Tim Flannery, —Fifty millennia of catastrophic extinctions after human contact”, *Trends in Ecology and Evolution* 20, no. 7 (July 2005): 395-401; Dave Foreman, *Rewilding North America: A Vision for Conservation in the 21st Century* (Washington DC: Island, 2004); EO Wilson, *The Creation: An Appeal to Save Life on Earth*[1161][1162]⁵⁷ (New York: Norton, 2006); Wilson, *The Future of Life*[y] (New York: Knopf, 2002); and Wilson, *The Diversity of Life*.

25. See Derrick Jensen, *Endgame*, vol. 1, *The Problem of Civilization* (New York: Seven Stories, 2006); Joel Kovel, *The Enemy of Nature: The End of Capitalism or the End of the World?*[z] (Nova Scotia: Fernwood, 2002); and Andy Fisher, *Radical Ecopsychology: Psychology in the Service of Life* (Albany: State Univ. of New York Press, 2002).

26. The global proliferation of non-native species prompted David Quammen to write a seminal essay aptly titled —The Weeds Shall Inherit the Earth”, *The Independent*, 22 November, 1998.

27. Some of the recent writings about the state of biodiversity would be: Wilson, *The Future of Life*; Sharon Guynup, ed., *2006 State of the Wild: A Global Portrait of Wildlife, Wildlands, and Oceans* (Washington, DC: Island, 2005); Burney and Flannery, —Fifty millennia of catastrophic extinctions”; Foreman, *Rewilding North America*; Michael J. Novacek, ed., *The Biodiversity Crisis: Losing What Counts* (New York: The New Press, 2001); Norman Myers and Andrew Knoll, —The Biotic Crisis and the Future of Evolution,” *PNAS* 98, no. 10 (May 8, 2001): 5389-92; Norman Myers—Conservation of Biodiversity: How are We Doing?” *The Environmentalist* 23, no 1 (March 2003): 9-15; Paul Ehrlich, —Intervening in Evolution: Ethics and Actions”, *PNAS* 98, no. 10 (May 8, 2001): 5477-80; David Quammen, *The Song of the Dodo: Island Biogeography in an Age of Extinctions* (New York: Scribner, 1996).

28. For a critique of the postmodern approach to environmental issues, see Eileen Crist, —Against the Social Construction of Nature and Wilderness”,[aa] *Environmental Ethics* 26, no. 1 (2004): 5-24.

29. All life, with the probable exception of the hardest generalists (which might well include humans) and much of the microbial kingdom.

30. In his latest plea for the conservation of life, *The Creation: An Appeal to Save Life on Earth*, EO Wilson classifies the impact of climate change on biodiversity as a form of —destruction habitat” (p. 81). Flannery makes the same point when he points out, about the demise of the golden toad[bb] (the first documented extinction due to climate change), that we destroyed the species with coal-fired power plants and sport

⁵⁷ There is an edition in Spanish: *The creation: let's save life on Earth*, Katz, 2007. *N. of t.*

utility vehicles[cc] so effectively as if we had razed its habitat with bulldozers. Flannery, *The Weather Makers*, p. 11 9.

31. Camilo Mora, Rebekka Metzger, Audrey Rollo, and Ransom Myers, —“Experimental simulations about the effects of overexploitation and habitat fragmentation on populations facing environmental warming”, *Proceedings of the Royal Society B* 274 (2007): 1023-28; here, p. 1027.

32. Reed Noss, —“Beyond Kyoto: Forest Management in a Time of Rapid Climate Change”, *Conservation Biology* 15, no. 3 (June 2001): 578-90; here, p. 581.

33. However, if the temperature increases, during this century, at a rate as fast as predicted (provided we do not act to stabilize the climate), it will exceed the “average rate experienced during the last 120,000 years” and the paleoclimatic conditions already they will not serve as —close analogs with which to compare a rapidly changing, anthropogenically warming world” Lee Hannah, Thomas Lovejoy, and Stephen Schneider, —“Biodiversity and Climate Change in Context,” in Lovejoy and Hannah, *Climate Change and Biodiversity* , p. 5. See also Anthony Barnosky, —“Effect of Climate Change on Terrestrial Vertebrate Biodiversity”, in AD Barnosky, ed., *Biodiversity Response to Climate Change in the Middle Pleistocene: The Porcupine Cave Fauna from Colorado* (Berkeley : Univ. of California Press, 2004), pp. 341-45.

34. Gian-Reto Walther *et al.*, —“Ecological Responses to Recent Climate Change,” *Nature* 416, no. 28 (March 28, 2002): 389-95; Camille Parmesan and Gary Yohe, —“A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems”, *Nature* 421, no. 2 (January 2, 2003): 37-42; Camille Parmesan and John Matthews,

[aa] There is a Spanish translation: —“Against the social construction of wild nature” in *Naturaleza Indómita*: [<http://www.naturalezaindomita.com/textos/contrala-construccin-social-de-la-naturaleza>][<http://www.naturalezaindomita.com/textos/contrala-construccin-social-de-la-naturaleza>]. *N. from t.*

bb “Golden toad” in the original. *Incilius periglenes*. Extinct in 1989. *N. of t.*

[cc] “SUVs” in the original. *N. of t.*

— “Biological Impacts of Climate Change”, in Martha J. Groom *et al.*, eds., *Principles of Conservation Biology*, 3[a] ed (Sunderland, MA: Sinauer Associates, Inc., 2005), pp. 333-74.

35. In their report on estimated extinctions as a result of climate change, Chris Thomas and colleagues argue that —“anthropogenic warming supersedes, at the very least, other known threats to biodiversity...[and] is very likely to be the greatest threat in many, if not most, regions. In addition, it is very likely that many of the serious impacts of climate change will result from the interaction between different threats. rather than being a result of the weather acting alone.” Chris Thomas *et al.*, —“Extinction risk from climate change”, *Nature* 427 (January 8, 2004): 147. An earlier review similarly noted that —“the Habitat fragmentation, coupled with climate change, are setting the stage for an even larger wave of extinctions than previously thought.” Maarten Kappelle *et al.*, —“Effects of Climate Change on Biodiversity: A Review and Identification of Key Research Issues”, *Biodiversity and Conservation* 8, no. 10 (October 1999) : 1383-97.

See also Parmesan and Matthews, —Biological Impacts of Climate Change”; Noss, —Beyond Kyoto.”

36. I am not using the expression —wilderness” in the sense of virgin nature, but to refer to areas that have become the last large-scale refuges for wild fauna, flora and ecosystems. . It is commonly accepted in ecology that no place on Earth can be considered virgin anymore. For example, the degree of contamination accumulated in the deep sea, one of the most inaccessible places on the planet (to visit it, not to dump waste into it), is horrifying. See Tony Konslow, *The Silent Deep: The Discovery, Ecology, and Conservation of the Deep Sea*, Chapter 7, —Dumping and Pollution” (Chicago: Univ. of Chicago Press, 2007).

37. Flannery, *The Weather Makers*, p. 172.

38. See Flannery, —Leveling the Mountains”, chapter 18 of *The Weather Makers*; Stephen Williams, Elizabeth Bolitho, and Samantha Fox, —Climate change in Australian tropical rainforests: an impending environmental catastrophe”, *Proceedings of The Royal Society B* 270, no. 1527 (September 22, 2003): 1887-92.

39. John Roach, —Penguin Decline in Antarctica Linked with Climate Change”, *National Geographic News*, May 9, 2001; Andrew Derocher *et al.*, —Polar Bears in a Warming Climate”, *Integrative and Comparative Biology* 44, no 2 (April 2004): 16376.

40. See Flannery, —Boiling the Abyss”, chapter 20 of *The Weather Makers*; Koslow, —Climate Change”, chapter 9 of *The Silent Deep*.

41. Lee Hannah *et al.*, —Conservation of Biodiversity in a Changing Climate”, *Conservation Biology* 16, no. 1 (February 2002): 264-68; GF Midgley *et al.*, —Assessing the Vulnerability of Species Richness to Anthropogenic Climate Change in a Biodiversity Hotspot”, *Global Ecology and Biogeography* 11 , no. 6 (November 2002) :445-51; J. Alan Pounds *et al.*, —Case Study: Responses of Natural Communities to Climate Change in a Highland Tropical Forest”, in Lovejoy and Hannah, *Climate Change and Biodiversity*, p. 70-74.

42. Tom Birch, —The Incarceration of Wildness: Wilderness Areas as Prisons”, in J. Baird Callicott and Michael P. Nelson, eds., *The Great New Wilderness Debate* (Athens: Univ. of Georgia Press, 1998), pp. 443-70.

43. With this I do not intend to deny the importance of —wilderness protected areas and national parks [as] the foundations on which the protection of biodiversity and the recovery of the wild[dd] are based” (Foreman, Rewilding North America, page 169). Wilderness reserves will be the foundation for the next step in “deep conservation”: connecting them together to create large landscape-scale dynamic patterns that allow the flow of species, individuals and genes of fauna, flora and fauna. the other organisms. See Michael Soulé and Reed Noss, —Rewilding and Biodiversity: Complimentary Goals for Continental Conservation,” *Wild Earth* 8, no. 3 (Autumn 1998): 19-28; Reed Noss, —Wilderness Recovery: Thinking Big in Restoration Ecology,” in Callicott and Nelson, *The Great New Wilderness Debate*, pp. 521-39; Tom Butler, ed., *Wild Earth: Wild Ideas for a World out of Balance* (Minneapolis, MN: Milkweed Editions, 2002); Josh Donlan *et al.*, —Pleistocene Rewilding: An Optimistic

Agenda for 21st Century Conservation”, in Marcus Hall, ed., *Restoria* (Cambridge, MA: MIT Press, in preparation); Guynup, *2006 State of the Wild*.

44. Thomas Lovejoy and Lee Hannah, —Global Greenhouse Gas Levels and the Future of Biodiversity,” in Lovejoy and Hannah, *Climate Change and Biodiversity*, pp. 387-96.

45. Chris Thomas, —Recent Evolutionary Effects of Climate Change”, in Lovejoy and Hannah, *Climate Change and Biodiversity*, pp. 75-88.

46. Lovejoy and Hannah, *Climate Change and Biodiversity*, p. 389.

47. Regarding the chytrid fungus that has led to the extinction of numerous species of frogs in Central and South America, Alan Pounds of the Monteverde Biological Station, in Costa Rica, says: —The disease was the bullet that killed the frogs, but the weather pulled the trigger” (quoted in Mac Margolis, —Why the Frogs Are Dying,” *Newsweek International*, Oct. 16, 2006).

48. Gelbspan, *The Heat is On*, p. 172.

49. Lovelock, *The Revenge of Gaia*, p. 3. 4.

50. *Ibid.*, p. 147.

51. An example from the *New Testament*: —And there will be strange happenings in the heavens, signs in the sun, moon and stars. And here below on earth the nations will be in confusion, bewildered by roaring seas and strange tides. Many people will lack courage because of the terrible fate they will see hanging over the earth, because the stability of the very heavens will be shattered... When you see the events I have described take place, you can be sure that that the kingdom of God is near”, Luke 21:25-33.

52. Jensen, *Endgame*, p. 226.

53. These statements are not intended as an outright condemnation of Christianity when it comes to ecological issues. A relationship of *careful stewardship*[ee]

[dd] —Rewilding” in the original. *N. from t.*

[ee] —Stewardship” in the original. The term —stewardship” is often used, especially in certain Anglophone environmental contexts, to imply a kind of benign or paternal management or domination of nature (as the main message of the Bible) has been promoted by some Christians, especially after historian Lynn White’s seminal essay, “The Historical Roots of our Ecologic Crisis,” which placed much of the blame for the ecological crisis on Christian anthropocentrism. See White, —The Historical Roots of our Ecologic Crisis”, *Science* 155, no. 3767 (March 1967): 1203-7.

54. Oliver Morton, —Is This What it Takes to Save the World? *Nature* 447 (May 10, 2007): 132-36.

55. David Wolman, —Rebooting the Ecosystem”, *Wired*, December 2006.

56. Paul J. Crutzen—Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?” *Climate Change* 77, no. 3-4 (August 2006): 211-19. “To compensate for the doubling of the amount of CO₂,” Crutzen notes, “the continued stratospheric loading would have to be considerable... [T]he sky would whiten somewhat, but there would also be colorful sunrises and sunsets” (p. 213).

57. Edward Teller, —“Sunscreen for Planet Earth”, *Wall Street Journal*, October 17, 1997. Teller ends his article as follows: —[I]f global warming policies require that ‘we do something’ when we really don’t yet know if anything needs to be done - let alone what exactly to do - let’s harness our uniquely American strength of innovation and technology to counteract any global warming at the lowest possible cost. As scientists continue to investigate the global climate effects of greenhouse gases, we should be looking at ways to counteract any possible detrimental effects. Injecting sunlight-diffusing particles into the stratosphere appears to be a promising approach. Why do not do it?”.

58. Murray Bookchin, *The Modern Crisis*, 2[a] ed. (Montreal: Black Rose Books, 1987), p. 32.

59. Paul Shepard, —“Ecology and Man—A Viewpoint,” in Sessions, *Deep Ecology*, pp. 131-40; here, p. 133.

60. This is a paraphrase of Horkheimer and Adorno’s statement: —“Men pay for the increase in their power with alienation from what they exercise power over”. Horkheimer and Adorno, *Dialectic of Enlightenment*, p. 9.

61. Wilson, *The Creation*, p. 91.

62. Paul J. Crutzen, —“The ‘Anthropocene’”, in Eckart Ehlers and Thomas Krafft, eds., *Earth System Science in the Anthropocene: Emerging Issue and Problems* (Berlin: Springer 2006), pp. . 13 and 16.

63. Jean Baudrillard, *Revenge of the Crystal: Selected Writings on the Modern Object and its Destiny, 1968-1983*, eds. and trans. Paul Foss and Julian Pefanis (London: Pluto Press, 1990), p. 103.

64. Peter Winch, *The Idea of a Social Science and its Relation to Philosophy*[ff] (London: Routledge & Kegan Paul, 1977), p. 107.

65. *Ibid.*, p. fifteen.

Nature; something like proposing to human beings as the “guardians” and “caretakers” who should take care of it, to protect and care for it (when not to try to “improve” it). *N. del t.* [ff] There is a translation into Spanish: *Social science and philosophy*, Amorrortu, 2012. *N del t.*

66. For a paradigmatic example of environmental fatalism, see Stephen Meyer’s essay in booklet form published in 2006. “There is nothing we can do to prevent major manifestations of the end of the wild for centuries to come,” Meyer tells us. . —“We have accumulated a gigantic extinction debt that turns recovery and restoration into an illusion -no matter how much effort is made”. Stephen M. Meyer, *The End of the Wild* (Cambridge, MA: MIT Press, 2006), p . 73.

67. For environmental fatalists, the destructive consequences of current patterns could be mitigated or partially offset by technological opportunities, sound management, and a few environmental victories here and there. —“Hopefully,” opines Crutzen, —the future ‘anthropocene’ will not *only* be characterized by continued human plundering of the Earth’s resources and dumping excessive amounts of waste products into the environment, but *also* for vastly improved technology and man-

agement, for the wise use[gg] of the Earth's resources, for the control of human and domestic animal populations and by careful and extensive manipulation and restoration of the natural environment. There are huge technological opportunities." Crutzen, —The 'Anthropocene,'" p. 17 (*italics added*).

68. Horkheimer and Adorno, *Dialectic of Enlightenment*, p. 37.

69. The kind of realism that remains prudently tied to facts and their inertia, which Horkheimer and Adorno bitterly called "dry sagacity" and "dreamless reason" - a kind of thinking that, without deep reflection and argumentation Rigorous, it removes the imaginative aspect of revolutionary thought as something irrelevant, romantic or childish.

70. What I know about the behavior of —systems“, I have learned through studying the science of Gaia, in particular the rich body of work by James Lovelock. See, for example, James Lovelock, *Healing Gaia: Practical Medicine for the Planet*[hh] (New York: Harmony Books, 1991).

71. The conceptual choices we make (in common parlance or in social science) to name, for example, certain "types of people" can create "strong interactions" with those same people. —I have called this phenomenon *the looping effect of human types*", explains Hacking. Ian Hacking, *The Social Construction of What?*[ii] (Cambridge, MA: Harvard UP, 1999), p. 34 (*italics in the original*).

72. Robert Merton, *Social Theory and Social Structure*[jj] (New York: Free Press, 1968).

73. Jürgen Habermas, *Toward a Rational Society: Student Protest, Science, and Politics*, trans. Jeremy J. Shapiro (Boston: Beacon Press, 1971), pp. 111-12.

74. Criticism is in itself a form of revolutionary praxis. This was an insightful insight into Critical Theory that seems to be often forgotten by academics today. [1164]⁵⁸

75. Kovel, *The Enemy of Nature*, p. ix.

⁵⁸ There is a Spanish translation: *The social construction of what?*, Paidós, 2001. *N. of. t.*

Presentation of "THE TALE OF MANAGED LAND"

In the following text, the author, David Ehrenfeld, shows a skeptical attitude towards technological progress. Throughout the article, he makes a general review of the technological solutions that are being promoted by those who believe that modern society could and should fully manage the Earth, pointing out many of its weak points. The author shows how the operation of many of the modern technological systems is more than deficient and how many of their failures are inevitable, since they are an inherent part of the very operation of said systems, making them unviable in the long term. And precisely in this lies the value of this article: it shows how a large part of the technophile promises are mere propaganda, boasts and daydreams that will never even come true or, at least, will not do it exactly in the way that their promoters hope and they preach. Of course, in the meantime, in the attempt and until their failure becomes clear, they will spoil everything even more, generating serious side effects, often unforeseen.

However, when it comes to questioning technological development, it is not enough to reveal the unrealistic and infeasible nature of many of its promises, pointing out those aspects of them that are intrinsically unfeasible. It is necessary to complement this critique of infeasibility with a deeper critique of the declared purposes or ends of technological development. It is not enough to show why many of the technophiles' goals will not be achieved (or why the results will not be exactly as expected and promised), but also to point out that these goals are not actually as good or desirable as the goals of the technophiles. promoters of technological development say. It is not enough to question the feasibility or viability of modern technologies, we must also question the value that is given to their usefulness, to the purposes for which they are supposed to serve. And this, Ehrenfeld, tends to overlook, focusing only on pointing out the limitations and flaws inherent in modern technologies, but without questioning the purposes for which these technologies are intended to be used.

Closely related to the foregoing, the author, despite having already spent many years analyzing and criticizing techno-industrial society, lacks the courage and/or intelligence necessary to draw from his own observations the obvious, clear and conclusive conclusion that industrial society based on modern technology doesn't work and we'd better get rid of it. Ehrenfeld, against all logic, grants a certain value and leaves the door open to certain forms of modern technology, even to those forms that he himself criticizes in the text, and to the possibility that this society continues thanks to tech-

nological innovation, savings of resources and energy or it is not clear to what. It is not surprising, then, that he says that he likes landscapes with wind farms .

Nor is it very clear that he is correct in his criticisms and arguments in all cases. Due to the dubiousness of some of the data, sources and references that he uses (for example, when he quotes the ecofeminist Vandana Shiva as saying that traditional crops produce more food per unit area than industrial monocultures; is this always true, with any crop and in any place?) it would be necessary to add the omission of certain data and important aspects in some cases (for example, he forgets to point out that one of the unavoidable deficiencies of wind and solar electricity production is that it is unpredictable, inconsistent and little reliable, since it depends on weather conditions).

On the other hand, the author, as is also the custom among many other conservationist and environmentalist authors, falls into idealism by stating, citing Wendell Berry, that the ultimate cause of modern problems is the desire for power and control (in reality, this desire, when it exists, is only a consequence of previous problems and material causes) and, consequently, proposes as a solution a general change in values and, more specifically, preaches the practice of humility and moderation in order to achieve “ a better world”. It seems unbelievable that someone so skeptical about the viability of modern technology and the limits of human predictability and control over natural phenomena is so naive about the feasibility and efficacy of strategies based on preaching widespread awareness and voluntary exchange of values. Like the technophile false promises, these widespread ideological shifts are neither going to happen nor, even if they did, would they work as their promoters expect them to. The “better worlds” usually end up being the worst hells.

Finally, a specific point: the “reforestation” that Ehrenfeld refers to in the text, in the section dedicated to geoengineering, is not always as good an idea as he claims. When said “reforestation” is based on the industrial monoculture of tree plantations of exotic and/or genetically modified species instead of the recovery of native forests (which is what happens in most cases), it is rather another ecological problem to add to the list, no matter how much CO2 it sequesters.

THE TALE OF MANAGED LAND

By David Ehrenfeld[i]

We must judge the infinite power of nature with more reverence, and with more awareness of our own ignorance and weakness... Why don't we remember how much contradiction we appreciate even in our own judgment? How many things that for us are fables today seemed to us yesterday articles of faith?

-Michel de Montaigne, Essays, 1580

Human civilization can only thrive in a healthy natural world. For at least two centuries, ecologists, conservationists, and ecologists—the greens—have been making

this appreciation, to their eternal glory, showing that technology, for all its ingenuity, will not last if it goes on alone, harming the natural world. and despising the essential place that nature has to occupy in our lives. Techno-optimism is a profoundly flawed worldview – not just morally and ethically, but technologically as well. Yet amid destruction on a planetary scale, technology remains alluring; even some greens are now heralding the arrival of a garden planet, in which all of nature has been tamed, preserved and managed, for its own good, by¹ sophisticated and progressive humans.² But these "neo-greens," or "ecological modernists" as they call themselves, are doomed to disappointment: the landscaped planet is just a virtual image; will never exist in the real world.

We don't need to be prophets to know that we don't have the technological capacity to produce and maintain a fully managed Earth that is also running smoothly. It is easy to show that many of the technologies that are supposed to manage the Earth no longer work well now and will be even more likely to fail in the future without extensive natural systems to serve as emergency backup.

Viewed from a human perspective, planetary landscaping can be broken down into several critical management areas. These include: food production, energy production, climate control through geoengineering, prediction, control and repair of accidents, restoration of damaged ecosystems, security of water supply, regulation of the size of the human population and the maintenance of functional cooperative relationships among nations. I will focus on the first four, although the others are also critically important. All of these processes should interact seamlessly; positive adjustment of one set of variables should not negatively affect the others.

Sustainable food production

In the 1940s, a technology began that would later be known as the "Green Revolution" and produced enormous increases in crop production, mainly cereals -rice, wheat, corn, etc.-, which they make up the bulk of our food supply. These increases in production were achieved by breeding dwarf plants that could respond to the application of synthetic nitrogen fertilizer by increasing grain production rather than developing longer stems and more leaves. The spectacular increase in food production that the Green Revolution brought saved millions of people from starvation. Rice production, the first crop to benefit from Green Revolution technology, increased tenfold and prices fell as a result. Norman Borlaug, the geneticist who was the father of the Green Revolution, was awarded the Nobel Peace Prize for his achievements.

¹ Translation of the chapter "The Fable of Managed Earth", from the book *Keeping the Wild: Against the Domestication of the Earth*, edited by George Wuerthner, Eileen Crist and Tom Butler (Island Press , 2014). Translation by Último Reducto. *N. from t.*

² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

An essential feature of the new agricultural technology was the cultivation of cereals in the form of fertilized and irrigated monocultures - one crop at a time, in huge fields. In these vast fields, the plants were more accessible to the machinery that applied not only the necessary chemical fertilizer, but also the recently developed insecticides, herbicides, and fungicides needed to protect the vulnerable crops from insect pests, weeds and fungi that thrive in monocultures. Large fields also allowed more efficient use of irrigation devices that provided water to dilute fertilizer in the soil and to irrigate dwarf crops, whose root systems were less capable of extracting water from dry soils than the roots of plants. traditional varieties.

The dramatic increase in production brought about by the Green Revolution reached its peak in the 1960s, 70s and 80s. In the 1990s, it was already becoming clear that production, especially of wheat and rice, had begun to stabilize. Farmers around the world had reaped the maximum benefit that technology could offer them. Lester R. Brown, then president of the Worldwatch Institute, wrote in 1997:

In any agricultural environment, in which production has increased substantially, there comes a time when the increase slows and even stops or shows signs of doing so... During the four decades from 1950 to 1990, growers The world's grain producers raised the productivity of their land by an unprecedented 2.1 percent a year but, since 1990, there has been a dramatic loss of momentum in 2 this increase. [two]

According to *Vital Signs 2006-2007*, grain production per person peaked around 1985.³ A growing world population (a growth fueled, ironically, by the Green Revolution) needs more food, yet the supply is no longer increasing proportionately.

Still, people had gotten used to the idea that technology would solve their food problems, and technology seemed poised to answer. Genetic engineering of food crops took center stage in the 1990s and early 21st century. People hoped that genetically modified (GM) crops would end world hunger.

However, the vast increase in crop production that was supposed to result from genetic engineering has not come to fruition, and seems unlikely in the near future. In fact, compared to that of conventional crops, GM production has often decreased, and the quality of GM seeds is sometimes poor.⁴ However, despite these mediocre results, by the beginning of the second decade of this century, the area occupied by GM crops in the United States, Brazil, China and other countries had increased remarkably. This increase occurred for various reasons, some of them related to the transitory advantages of the new crops, but another significant factor was the link between economic aid and

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

the political power of the multinationals that produce GM seeds. On the other hand, the nations of the European Union and India have largely rejected GM crops for fear of their biological and socioeconomic side effects .

As I write this, supporters of genetic engineering and its opponents are fighting a fierce battle, with wins and losses on both sides. Genetic engineering is not likely to go away, but its promise that it could end world hunger has no basis in reality; GM crops are not another Green Revolution.

What went wrong after forty years of the Green Revolution? And then, more quickly, what happened to genetic engineering?

The Green Revolution fell victim to a host of intractable problems. It depended entirely on a cheap energy source to produce synthetic nitrogen fertilizer, to make and run the machinery needed in monoculture fields, and to pack and transport crops to distant markets. In the 1970s, and especially in the 1990s, cheap energy began to become a thing of the past.

Monoculture fields, which were a key part of the Green Revolution, were also causing serious problems. The heavy machinery used in the fields was compacting and destroying the soil, increasing erosion and decreasing the fertility of the land. Chemicals used to combat pests, weeds and diseases, which are a hallmark of monocultures, were affecting the integrity of ecosystems as well as the health of humans and other species. Irrigation required large amounts of energy and was drawing down scarce groundwater supplies. And the shift from many small farms to a smaller number of large holdings, combined with the substitution of machine labor for farm workers, caused mass migration from rural areas to cities around the world, from São Paulo to Manila, creating huge suburban slums.

Genetic engineering has had less time than the Green Revolution for its problems to become apparent, but to date they seem just as numerous and intractable. Some are specific to this technology, others are shared with the Green Revolution .

One of the specific problems with genetic engineering is its exaggerated claims based on a genetic fallacy. It is well known that most genes have more than one function, often many more, and that the expression of those functions can be influenced by the changing environment of the cell, the organism as a whole, and the outside world. However, the hype surrounding genetic engineering is based on the false belief that each gene does only one thing - even when a gene is transferred from one species to another - and that its expression remains constant over time. . Sometimes this is true; but very often it is not. The public sees only the illusion of "one gene, one function." The high failure rate of genetic engineering is proof that this hype cannot be trusted. For example, in March 2012, Reuters reported that a group of plant physiologists were warning that Monsanto's GM maize, which had been modified to resist corn rootworm[ii], was "losing its efficacy", being able to entail potential "significant production losses". Similarly, in November 2011, the US Department of Agriculture, in an extensive study of Monsanto's "drought tolerant" corn (MON87460), concluded

that "equally resistant varieties are readily available." to drought and produced with traditional selection techniques."⁵

Despite what agribusiness claims, genetically modified crops have led to an increase in the use of pesticides. This is not surprising, since the companies that develop and sell the seeds are the same ones that make the agricultural chemicals. For example, seeds genetically engineered to contain a bacteriological pesticide, *Bt* toxin, a toxin that occurs naturally in bacteria of the species *Bacillus thuringensis*, kill some pests, but their use results in the strengthening of other pests that were previously considered secondary disturbances, since they rush to fill the empty ecological niche, causing unexpected consequences. In a May 2010 *Nature* magazine article, Jane Qiu offers an example:

More than four million hectares of Bt [GM] cotton are now cultivated in China. Since the crop was approved, a team led by Kongming Wu, an entomologist at the Chinese Academy of Agricultural Sciences in Beijing, has been monitoring pest populations in 38 locations in northern China, looking at 3 million hectares of cotton. ...found that the number of [452] mirid bugs⁶ ...previously only secondary pests in northern China, has increased 12-fold since 1997 ... [and according to Kongming Wu]" mirids are not sensitive to the Bt toxin, so they began to thrive when farmers started using less pesticide [for bollworms⁷⁸]"⁹. [Myrids also eat] green beans, cereals, vegetables, and various fruits. the increase in mirids has caused Chinese farmers to turn to pesticides.¹⁰

A perhaps more serious problem caused by agricultural technology - both the Green Revolution and genetic engineering - is the erosion of the genetic base on which all forms of agriculture depend. For more than ten thousand years, farmers have been growing and saving seeds from those plants they have deemed most productive, most resistant to pests, diseases, drought and floods, and most palatable. Tens of thousands of local varieties of hardy crop plants that produce high-quality food even under harsh conditions are the legacy of all these millennia of agriculture. The best seeds have always been saved and passed on to the next generation by the farmers who grew them, and since the 19th century they have also been produced and sold by many seed companies. However, starting with the Green Revolution and picking up pace with the advent of genetic engineering, restrictive patent laws and the growing power of agrochemical companies (which today own most seed companies) have caused the loss of thousands of pre-existing crop varieties. Many of the companies that own these

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ "Pristine wilderness" in the original. *N of the t.*

⁷ Heteropteran insects of the Miridae family. *N. from t.*

⁸ "Bollworms" in the original. Common name of various species of moths whose larvae attack, among other plants, cotton.

⁹ Chinese farmers stopped using pesticides on cotton because they substituted conventional cotton crops for *Bt* cotton, which produced its own toxin against bollworms, but not against mirid bugs. *N. from t.*

¹⁰ A couple of examples:

varieties have deliberately stopped producing them in order to pave the way for their own proprietary seeds. Today, restrictive laws in some countries punish farmers who save their seeds. The loss of agricultural varieties is a worldwide phenomenon. For example, according to Dr. H. Sudarshan, in India, where there were an estimated 30,000 native varieties of rice during the first half of the 20th century, it is now expected that only 50 varieties will soon remain, with the top ten occupying more than three quarters of the cultivated area of rice in that subcontinent.¹¹

The spread of genetically engineered crops is becoming a threat to traditional varieties and to the wild relatives of our crops. Despite big business claims to the contrary, engineered genes are escaping the farm fields and contaminating the gene pools of traditional crops and their wild relatives. It is a paradox that the success of the Green Revolution, of GM crops, and of conventional agriculture depends largely on the preservation of gene pools that are today being deliberately discarded by agribusiness, killed by herbicides, or accidentally contaminated by modified genes. The genetic engineers are sawing off the very branch they are sitting on.

Another effect of genetic contamination is the transfer, from crops to weeds, of genes that confer genetically modified traits. In a more recent news article in *Nature*, in August 2013, Jane Qiu reports that transgenes from rice crops genetically engineered to resist the herbicide glyphosate have mixed with those of some weeds which are wild relatives of rice. The weeds have not only become resistant to herbicides, but now have higher rates of photosynthesis, put out more shoots and flowers, and produce 48 to 125 percent more seeds per plant than their non-GM relatives. An ecologist at Fudan University in Shanghai notes that “making a weed related to rice more competitive could exacerbate the problems the weed causes for farmers around the world.”¹²

Monocultures have been praised for their high yields, but even this appears to be wishful thinking. Physicist and agricultural scientist Vandana Shiva has exposed what she calls “the productivity myth.”¹³ Traditional polyculture systems, in which many

¹¹ For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

¹² The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

¹³ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited

different crops are grown close to each other on the same farm, actually produce more food per unit area than modern monocultures. A mixture of maize, cassava and peanuts produces less maize per acre¹⁴ than a monoculture of GM maize, but produces two and a half times more *food* per acre. As Shiva points out, “Mayan farmers in the Mexican state of Chiapas are branded as unproductive because they produce only two tons of corn per acre. However, the total food production is twenty tons.” Shiva concludes that “industrial farming has actually reduced food security by destroying small farms and the ability of small farmers to produce diverse harvests of nutritious crops.”

Sustainable energy production

It was cheap energy that fueled the Green Revolution and the entire industrial revolution of the 20th century. The main source of energy was oil, a concentrated energy source that was easy to extract from underground. Coal and natural gas completed the trio of “fossil fuels”, carbon-rich substances that were the result of millions of years of degradation by plants buried deep underground. Although vast, fossil fuel reserves are finite, and the easily extractable parts of those reserves have been largely depleted.

As the physicist Albert Bartlett pointed out,¹⁵ with an increase in fuel consumption of 7 percent per year, a typical 20th-century growth rate, the amount of oil consumed in ten years is equal to the total oil consumed throughout all of history prior to that decade. In other words, simple arithmetic shows us that if oil consumption grows at a rate of 7 percent per year between the years 2010 and 2020, then during that same decade we will have used an amount of oil equal to all the oil consumed over the years throughout all the years leading up to 2010. It was clear that these extraction rates could not continue, and they have not. Economist Herbert Stein put it succinctly in what has come to be called Stein’s Law: “If something can’t go on forever, it will eventually stop.”

The cheap energy that industrial civilization has helped produce is nearly gone, as anyone who buys gasoline knows. This author remembers once, in the middle of the

us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (The Earth Runs Out , page 237).

¹⁴ An acre is approximately equal to 0.4 hectares. *N. from t.*

¹⁵ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

“gasoline war”, during the 50s, having bought gasoline at 11 cents a gallon¹⁶ to fill the tank of his gas-guzzler¹⁷; now gasoline is more than thirty times more expensive. A part of the difference is due to the fall in the value of the dollar; most of it is due to dwindling supplies of cheap oil. Modern technologies for prospecting for new oil reserves are very sophisticated, yet discoveries of new oil reserves peaked in the 1960s. And oil consumption continues to grow, fueled by consumer demand and industrial expansion in China and India. However, according to *World Energy Outlook 2010*, global oil production peaked in 2006 and is expected to decline from 70 million barrels a day in 2006 to less than 16 million in the 2035. The International Energy Agency, the US Joint Forces Command Center[viii]¹⁸ and the oil companies themselves know that cheap oil is a thing of the past.

The demise of cheap oil (and cheap oil = cheap energy) is an inescapable fact, so technophiles have shifted their focus to the idea that technology will invent oil substitutes to power our technological civilization, and maintain Live your hopes that cheap energy will continue to be available to run a managed planet. Conversion of coal into liquid fuel; nuclear fission or fusion; hydrogen; oil sands and shale; hydraulic fracturing to obtain natural gas; drilling of offshore and offshore oil and gas wells; and “renewables,” including solar, wind, and biofuels. All of them are expected to save us.

However, cold facts shatter this dream. Certainly, almost all of the much-lauded substitutes for oil are technically feasible and have been shown to work, but they all have one or more serious problems. They require large-scale investment and have long start-up periods. They often need considerable financial support from governments. Some of them routinely cause serious environmental damage and emit large amounts of greenhouse gases. Some are subject to a high risk of serious accidents. Their processing can place a high demand on scarce freshwater reserves and can require large inputs of energy for production. They may not be able to produce enough energy to replace what we consume today. And it is certain that all the new substitutes are more expensive, often much more expensive, than conventional oil.

Vaclav Smil of the University of Manitoba, one of the world’s leading energy experts, wrote in the May-June 2011 issue of *American Scientist* about substitutes for conventional oil, calling them “the last infatuations”.¹⁹ They reminded him of the scientists at the great Lagado Academy in *Gulliver’s Travels*, who had spent eight years on a project to extract sunlight from cucumbers. (Actually, as mentioned below, cucumbers

¹⁶ A gallon is equal to about 3.78 liters. *N. from t.*

¹⁷ “Gas guzzler” in the original. It refers to the fact that at that time American cars were manufactured without taking into account any measures to optimize fuel economy since fuel was so cheap that it was not worth worrying about reducing its consumption. *N. from t.*

¹⁸ “US Joint Forces Command” in the original. *N. from t.*

¹⁹ For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

could probably be used for biofuel, but no one in their right mind would think that the world's energy needs could be met using cucumbers.)

Enthusiasm for new energy sources first waxes and then wanes, as does all new fads. A few years ago the novelty was hydrogen: hydrogen-powered cars and distributed energy systems²⁰ were all the rage. However, when people stopped to think about it, they realized that hydrogen is not a primary source of energy (there are no hydrogen wells) - it takes money and energy to extract it from natural gas or water. In addition, hydrogen is highly explosive (remember the Hindenburg disaster²¹), it is corrosive, and even in liquid form it contains much less energy per gallon than oil. No wonder you hear less about hydrogen cars today than you did back in 2002.

Before the hydrogen craze, nuclear fusion was going to be our salvation. It was thought that ordinary seawater, which was considered an inexhaustible resource, would serve as fuel for fusion reactors. The first patents for fusion reactors were registered in 1946. In 2012, after sixty-six years and millions of dollars invested in research and development, I attended a lecture given by an eminent fusion scientist who was still just as enthusiastic about the limitless potential of fusion. When asked how long it would take to get a reactor up and running, he said another thirty or forty years.

Nuclear fission power plants have existed for decades in many countries. The oldest operating commercial nuclear power plant in the United States, the Oyster Creek plant in New Jersey, has been producing electricity since 1969, and is not scheduled to shut down until 2019. Until the Fukushima Daiichi disaster, caused by After the Tohoku earthquake and tsunami in March 2011, many people assumed (despite previous accidents at the Three Mile Island and Chernobyl plants) that nuclear power would ease the transition to a new world based on renewable energy. Since Fukushima, fission has become a growing cause for concern: Few new reactors are being built; Germany has announced that it will completely abandon nuclear power generation in 2022; and, after Fukushima, Japan closed or suspended its 50 nuclear reactors.

Furthermore, as Mark Bittman pointed out in *The New York Times*, on August 24, 2013:

*The dangers of uranium mining, which uses large amounts of water... [are] barely regulated or even studied. Thousands of uranium mines have been abandoned and no one seems to know how many remain to be cleared. The cost of such cleaning. will be paid for by taxpayers. Then there is the disposal of spent nuclear fuel. Incredibly, after decades in the nuclear age there is still no real plan to dispose of this waste. The economic viability of nuclear power generation is no more encouraging. Plants continue to close and production rates continue to fall. State financial aid for nuclear power has been more than twice the cost of power generation itself.*²²

²⁰ Distributed or decentralized energy basically consists of the generation of electrical energy through many small energy sources in places as close as possible to the points of consumption. *N. from t.*

²¹ The LZ 129 Hindenburg was a German airship, destroyed by fire in 1937. *N. from t.*

²² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

The oil shale of the United States and the tar sands of Canada contain large oil reserves, but the environmental damage associated with the extraction of this oil is immense, for this process a large amount of fresh water is used, its Energy Return Rate (TRE), the amount of energy produced divided by the amount of energy invested, is terrible - only about three barrels of oil produced for every two barrels spent - and the need to build pipelines to transport over many miles the oil Heavy and toxic crude oil, from remote production sites to distant refineries, creates serious political and environmental problems. Oil from beneath the seafloor, another much-hyped energy source, is extremely expensive and suffered a serious setback with the explosion of the *Deepwater Horizon*²³[463][cdlxiii][464]. The *Deepwater Horizon* oil rig cost \$1 billion to build and cost half a million dollars a day to run - while it lasted.²⁴

Improvements in the efficiency of energy production and use can save a great deal of energy. These improvements are desirable and possible. However, I repeat, they are unlikely to meet the energy needs of an intensely managed planet. Modern agriculture is much less energy efficient than traditional farming systems, which take advantage of free inputs of energy from nature. And, even when efficiency gains are achieved, one must reckon with the Jevons paradox, first described by the English economist W. Stanley Jevons in 1866: increased mining efficiency leads to decreased coal costs. , which in turn causes an increase in consumption, by way of a rebound. This paradox is applicable to energy sources other than coal.²⁵

Renewable energy. Let's take a closer look at renewable energy: solar, wind and biofuels, the great hope of the neogreens. According to Smil, the renewable energy renaissance "has created exaggerated expectations rather than realistic valuations." In 2011, he wrote:

*The promoters of the new renewable energy conversions that today seem to have the best chance of making significant contributions in the short term - modern biofuels (ethanol and biodiesel) and solar and wind electricity generation - do not give sufficient weight to the physical facts regarding the global shift away from fossil fuels: to the scale of the transformations required, to their likely duration, to the unit capacities of the new converters, to the enormous infrastructural requirements stemming from the inherently low energy densities that we can obtain from the renewal flows of energy and its [irregularity].*²⁶

²³ The *Deepwater Horizon* was an oil platform, located in the Gulf of Mexico, that sank in

²⁴ Examples:

²⁵ In other words, the paradox is that the increase in efficiency in the processes of production and use of resources does not reduce their consumption or encourage their saving, but, rather, increases their consumption by lower its cost. *N. from t.*

²⁶ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater

Solar energy. In his well-researched book *Green Illusions*, ecologist Ozzie Zehner says:

If the costs of solar projects actually installed in California are any guide, a global solar program [to replace fossil fuels in powering the planet] would cost approximately \$1.4 trillion²⁷] dollars, about a hundred times the GDP of the United States. The mining, smelting, processing, transportation and manufacturing required to build the [solar] panels and their associated technological infrastructure would produce about 149,000 megatons of CO₂. And we should all move to the desert, otherwise transmission losses would make the plan unfeasible.²⁸

Future costs of solar panels may be reduced by technological innovations (costs may have already started to level off), but as Zehner points out:

Cheaper PV devices won't offset the rising costs of insurance, warranties, materials, transportation, labor, and other requirements. Low-tech costs claim an increasing proportion of the price tag of a high-tech solar system.²⁹

Passive solar energy, which means saving energy in heating and air conditioning obtained through sophisticated architectural constructions and designs, has been proving its worth for millennia, as the natives of what is now New Mexico demonstrated in the 10th century, with that complex of homes, incredibly energy efficient, that today we call Pueblo Bonito³⁰. Energy efficiency was taken into account from the beginning of the construction of Pueblo Bonito. Modern passive solar houses being built today can be just as energy efficient and a joy to live in. However, many, perhaps most, of today's existing homes have limited potential for passive solar enhancement.

Solar power has an important role to play as one of the energy sources of the future, but it doesn't look like it's about to replace cheap oil in sustaining our current industrial civilization.

Wind power. Wind power, like solar power, is receiving a great deal of enthusiastic praise, some of it justified. I am among those who find the sight of a row of gigantic, towering wind turbines with their slowly moving blades moving and beautiful, but I have to admit I don't live near them. Denmark is the pioneer of wind energy: in 2012, Denmark obtained between 25 and 35 percent of its electricity from the wind, and now this country hopes to increase these figures to 50 percent or more. Denmark also

capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

²⁷ "1.4 quadrillion" in the original. In modern English, this amount refers to 1,410[15] (1,400 billion in Spanish). *N. from t.*

²⁸ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

²⁹ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

³⁰ In Spanish in the original. *N. from t.*

produces half of the world's wind turbines. As with solar energy, wind power has much to offer in an energetically bleak future. However, not everything in wind energy is hunky-dory.

In *The New York Times* of August 15, 2013, Diane Cardwell recounts the problems experienced by Green Mountain Power, whose wind turbines are lined up on the top of Mount Lowell in Vermont.³¹ These problems are typical of those experienced by the wind power industry. Some of the difficulties involve "restrictions", mandatory cutoffs in power production when the grid does not accept wind power, either because the power company can get cheaper power elsewhere or for technical reasons that have to do with the relationship between electric power generated from fossil fuels and wind power. Other difficulties are related to the size of the lines that carry electricity. When constraints occur, wind turbines must operate at only a fraction of their potential output. In his article, titled "Intermittent Nature of Green Power Is Challenge for Utilities," Cardwell writes:

*Since the energy produced by the wind ... is intermittent, its generation capacity is more difficult to predict than that of conventional electricity production. And the absence of widely available and cost - effective storage methods for wind - generated electricity only complicates today 's already complex market . [A senior official at a wind energy company pointed out that], operating at full capacity, you stand to lose \$1,000 an hour if the electricity is not sold. "We have a supply network that is not smart. It is a system that is a hundred years old. And they run it as if fossil and nuclear energy were the only ones that mattered and could play with the rest of us," he said.*³²

Integrating wind-sourced electricity into an electrical system that receives inputs from fossil fuel and nuclear power plants, in addition to the increasingly abundant inputs from solar installations, poses daunting economic and technical challenges. Over time, some of them will be quite simple to solve, others, such as the difficulty or impossibility of storing excess electricity produced by the wind when the grid cannot accept it, are much more difficult to solve.

Among the other problems that are an inseparable part of wind energy are that wind turbines kill bats and migratory birds, that wind installations for electricity production on the roofs of city buildings are noisy and difficult to maintain, that installing turbines high on mountain ridges damages and fragments some of the last undisturbed wildlife

³¹ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*["< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it"]" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

³² Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

habitats, and many people complain that large turbines spoil views of the countryside or coastline around their homes.

Bat and bird deaths caused by turbines are easy to document. Numerous accounts of dead birds and bats collected under the turbines have been published; but there is still no evidence that any population is being threatened by wind power and some radar studies have shown that birds fly safely over the turbines during migrations. Urban wind power production on top of tall buildings has been promoted by neogreens as a renewable source of energy in cities, but noise and maintenance issues are likely to limit the potential of urban wind power for a near future. Even outside of cities, some people who live near wind turbines in rural areas complain of health problems such as insomnia, anxiety, heart palpitations, and nausea, allegedly related to low-frequency noise. The existence of this “Wind Turbine Syndrome” is still being debated.³³ And when it comes to the question of the ugliness of the windmills, there is no adequate answer; some love them and others don’t.

Biofuels. Biofuels are another dubious boon as substitutes for dying energy from fossil fuels. The idea of biofuels is simple: use plants to capture the sun’s energy (such as cucumbers from Lagado) and extract some of that energy back from the energy-rich substances produced by those plants (sugars and hydrocarbons) that can either be transformed into fuels, such as ethanol, through chemical processes or be used directly as a substitute for diesel. Corn, sugar cane, soybeans, rapeseed, palm and other trees that produce oil, grasses, algae and the desert plant known as *jatropha*[xvi] are some of the vegetables used to produce biofuels.

Like solar and wind energy, biofuels have their dark side. Some of the plants cultivated to produce biofuels, especially grasses, can escape from the fields and become invasive species, especially harmful to agriculture.

The ERR of biofuels is worrisome. Ethanol made from corn in the Midwest has an ERR close to 1 or less, which means that if we add up the total energy expended growing the corn, harvesting it, and processing it, we find that the amount of energy that we obtain is only the same or less than the one that we have invested; a clearly losing bet. In the meantime, we will have depleted land that could have been used to grow food, and we will also have raised the price of corn. The ERT of other biofuels may be better than that of corn ethanol, but it is not always high enough to compensate for the other difficulties inherent in this technology.

If the results for corn ethanol are so poor, why does the Midwest continue to produce it in large quantities? The answer is political: the Midwest receives huge federal

³³ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

subsidies to grow corn and produce ethanol, and few politicians are willing to tell the truth about corn ethanol and risk angering voters in that region.

As land is used to grow biofuel-producing plants, it is no longer available to grow food in a hungry world. It's true that plants like jatropha grow well in dry, nutrient-starved soils unsuitable for other crops, but the predictable supply of jatropha-derived biofuel could power only a small fraction of the world's vehicles.

Timothy Beardsley summarized the problems associated with biofuels in an editorial titled "Biofuels Reassessed" in the October 2012 issue of *BioScience*:

It takes a lot of land, a lot of water, and a lot of energy to grow plants for biofuels and then turn them into usable fuels. The displacement of food crops by biofuels has already pushed up food prices and many have said that these effects will put a cap on the biofuel adventure... enthusiasts are right when they say that improvements [in biofuel technology] are possible ... and the severity of the looming energy crisis - only partially alleviated, at substantial environmental cost, by hydraulic fracturing - requires that such improvements continue to be attempted. Nevertheless . it is important to understand the limitations of biofuels.[468]

Beardsley cites scientific studies showing how the amount of biofuels that could be produced globally is four times less than previously published estimates:

All of these figures exclude losses due to fuel manufacturing...actual primary production today strongly suggests that biofuels may hold less promise than many had believed. Some new biofuels may already alleviate humanity's problems, but no one should have any illusions about the restrictions that nature - ultimately, through the laws of thermodynamics - has placed in their way.³⁴

To close this section on renewable energy, we should take into account the words of Vaclav Smil: "None of us can foresee the final form of the plans for new energy, but could the richest countries in the world be wrong if they tried to to moderate your energy use?"³⁵. In other words, the best we can do to manage the Earth and our own civilization is to rely less on control technologies and more on the regulation of our own self-destructive consumption.

Geoengineering to control climate change

To begin with, climate change is a fact. In 1981, NASA physicist James Hansen calculated how much he expected the climate to change in the near future, based on man-made CO₂ emissions. Three decades later, these calculations have proven to

³⁴ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

³⁵ "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

be exceptionally accurate.³⁶ Temperatures have risen to meet or exceed the levels predicted by Hansen; polar ice is melting; and drought-prone areas are receiving less rainfall. In recent years, other consequences of climate change - stronger and more frequent storms and rising sea levels - have forced us to pay attention. In a May 9, 2012, *New York Times* article, Hansen said that if we continue to burn conventional fossil fuels and mine Canada's tar sands:

*Concentrations of carbon dioxide in the atmosphere would eventually reach levels higher than those of the Pliocene, more than 2.5 million years ago, when sea level was at least 50 feet[469] higher than it is today . the disintegration of the ice caps would accelerate out of control. Sea levels would rise and destroy coastal cities. Global temperatures would become intolerable. Between 20 and 50 percent of the planet's species would be pushed to extinction. Civilization would be in danger. This is the long-term paronama. But, in the short term, things would be bad enough. Over the next several decades, the western United States and the semi-arid region between North Dakota and Texas would develop a semi-permanent drought, with rain falling, if at all, sporadically and torrentially, causing severe flooding. . The economic losses would be incalculable. More and more of the Midwest would be a "dust bowl"*³⁷ . The

*Central Valley of California could no longer be irrigated. Food prices rise 24 would rise to unprecedented levels.*³⁸

Other parts of the world, including the most populous nations China and India, are already feeling the effects of climate change. In China, the Gobi Desert is expanding, moving into the Yellow River, and is already 100 miles from Beijing. The growth of the Gobi is not only the result of climate change, but also the careless use of groundwater and indiscriminate logging in the past. Groundwater use and logging can be and is being controlled to some extent by the government, and millions of trees are being planted on the edges of the desert to stop its advance, but global warming is a constant presence. In India, today the sixth largest emitter of greenhouse gases (carbon dioxide, methane and nitrous oxide) in the world, catastrophic flooding has been blamed on climate change; the melting of the Hindu Kush ice sheets is accelerating; and rising sea levels are pushing saltwater into coastal aquifers, contaminating drinking water.

The solution to the problem of climate change is obvious: we must immediately stop the expansion of the release of greenhouse gases and start quickly reducing it below current levels. Several highly publicized government meetings have taken up this issue, with some positive results. However, international environmental agreements

³⁶ Page 114.

³⁷ Literally "Dust Bowl", "Dust Bowl" is the name by which the phenomenon is known in English in the 1930s that affected the plains and prairies that stretch from the Gulf of Mexico to Canada. It was one of the worst ecological disasters of the 20th century. The drought-resistant grasses of the original prairie ecosystem were replaced by wheat crops that, failing due to drought, left the soil bare, creating dust storms of unprecedented magnitude. The "Dust Bowl" was caused by a persistent drought and favored by the expansion of agriculture in the previous decade. *N. from t.*

³⁸ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

are subject to compromises and delays; and, meanwhile, the levels of greenhouse gases continue to rise.

Impatient with political processes, some scientists have decided that geoengineering holds the best promise for managing our planet. Geoengineering solutions fall into three categories: dimming sunlight reaching Earth, using plant photosynthesis to absorb and reduce carbon dioxide already in the atmosphere, and capturing carbon dioxide, turning it into carbon. and burying it in the Earth.

Various ways of reducing the sunlight reaching the Earth have been proposed. One solution, inspired by observations of the effects of volcanic eruptions, would be to spray the stratosphere with an aerosol of sulfates that reflect sunlight, perhaps from giant balloons. Some other projects are considering using rockets to send tiny reflectors into space, planting genetically modified crops to have lighter colors to reflect sunlight, painting all rooftops white, and covering all deserts on Earth with PET³⁹ reflective.

Some of these ideas, like covering deserts with plastic or light-colored crops, are so far-fetched that they deserve no comment. Upon careful evaluation, most projects, such as painting all roofs white, would not have a large enough effect to make a significant difference in terms of global warming. Injecting 5 million tons of sulfates a year into the stratosphere (like other projects based on shading sunlight) could really make a difference, especially in the tropics, but it could also disrupt the monsoons, bringing famine to millions of people. and, according to Oxford scientist Tim Palmer,⁴⁰ "We could turn the Amazon into a desert." It is estimated that sending enough tiny reflectors into space could require about 20 million rocket launches. And, if there were negative side effects, how would we then remove those little reflectors from there?

Using plants to remove carbon dioxide from the atmosphere through photosynthesis has no obvious adverse side effects, and has the added benefit of replacing the removed carbon dioxide with oxygen. Planting relatively fast growing trees can sequester a fair amount of carbon dioxide. Reforestation is generally a good idea, not only because of carbon sequestration but also because of its beneficial effects on local climate, water storage, and stream flow.

Reforestation, however, is slow, varies greatly from country to country, and can pose ecological and social challenges. Reforestation can be a totally beneficial procedure when it comes to curbing climate change. However, planetary managers are an impatient people and reforestation is too slow for many of them.

Algae in the world's oceans capture a lot of carbon dioxide through photosynthesis, and some climate engineers might ask, why not fertilize the oceans, increase the number of algae and capture more carbon dioxide? This would curb climate change, benefit marine food webs that are based on algae, and even, in closed systems, produce algal biomass that could be used as feed or to make biofuels. This is the theory, and in a

³⁹ "Mylar" in the original. "Mylar" is the trade name in the United States for polyethylene terephthalate, a plastic better known in Spanish as PET. *N. from t.*

⁴⁰ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

way it works. Pouring iron fertilizer into the ocean actually stimulates algal growth; the algae capture carbon dioxide and, when they die, some of them take the carbon out of harmful cycles by sinking it to the bottom of the ocean.

Unfortunately, iron fertilization of the oceans can also stimulate toxic algae blooms and cause the production of nitrous oxide, another greenhouse gas. And, when the algae die, as they do in large numbers during blooms, the decomposition of the algae that remain on the surface consumes the oxygen in the water and returns carbon dioxide to the atmosphere. In artificial closed systems, unlike in ocean fertilization, the main difficulties would be the costs of building, maintaining and oxygenating the tanks containing the algae and the problem of scale: these systems would have a limited impact on global climate change and in the energy production of biofuels .

Carbon dioxide capture and storage is one method that can reduce the carbon dioxide that causes climate change. Carbon dioxide is captured and extracted where it is produced, usually the smokestacks of large power plants that use fossil fuels to produce electricity, and is then taken to places where it can be deposited underground. This is a good idea, but one that is limited in scope as there are so many non-point sources of greenhouse gases. The main risk of carbon capture and storage is the leakage of the gas back into the atmosphere from its underground burial places (declining oil fields, saline aquifers, unminable coal beds, and other geological formations). Deep injection of unwanted substances into wells has caused earthquakes. Not to mention that carbon capture and storage is much more expensive than simply letting the gas escape into the atmosphere, and could require government-funded incentives and aid.

Geoengineering is very attractive to those looking for quick and simple solutions to daunting and complex problems. This search tends to promote narrow-mindedness, in which the gaze is always set on simple models and the technical solutions associated with them, not on the many side effects, sometimes serious, unpredictable and impossible to manage, that would cause geoengineering technologies. Vaclav Havel, author and first president of the Czech Republic, wrote in *The New York Times*, on September 27, 2007:

I am skeptical that a problem as complex as climate change can be solved exclusively by any branch of science. Technological measures and regulations are important, but equally important are support for ecological education and training and ethics - an awareness of what all living things have in common and an emphasis on shared responsibility.[26]

Prediction, control and repair of accidents

Our global management systems rest on a precarious predictive structure. This is made up of predictions about the sustainability of industrial agriculture, the safety of nuclear power plants, the stability of the political structure, the effectiveness of the ecological restorations we carry out, the future of globalization - especially of global

trade - of continued economic growth and, above all, of the ability of our technology to solve any problem we face, today or in the years to come.

These predictions are often unjustified and very dangerous. One might think that the top priority for the managers of the planet would be to look back at their past predictions and assumptions and see how well they have worked out. But this would mean having to admit failure and, more importantly, cutting off sources of income for failed projects. Consequently, the risk studies that are carried out at the beginning of the projects are often unfounded justifications but well “prepared” for the programmed activities to go ahead no matter what.

In their book *Useless Arithmetic: Why Environmental Scientists Can't Predict the Future*,⁴¹ geologists Orrin Pilkey and Linda Pilkey-Jarvis show how a model about future erosion of beaches and the movements of the coastal sands to justify the flight from reality and allow the construction of questionable structures and buildings on the coast. The typical model used in beach engineering is Bruun's Rule, which describes how coastlines retreat in response to rising sea levels. This simple model for describing a complex process has general validity, but, as the authors point out:

The Bruun Ruler inhabits a world dominated by engineers, not scientists. It is a world where it is not possible to admit defeat and walk away calmly or respond in a flexible way, a world in which an answer must be found... and in which the answer, to be credible, had better be found. by the most sophisticated means possible. . Evidence continues to accumulate from around the world that the basic assumptions underlying Brunn's model are seriously wrong. However, it continues to be widely applied by scientists, planners and international agencies interested in coastlines and concerned about how they will affect 28

future global trends to coastlines.

When using Bruun's Rule to predict the rate of erosion for a particular coastline, all that is needed is to know the rate of sea level rise and the slope of the surface for that particular beach. Two variables: it's easy. However, as Pilkey and Pilkey-Jarvis point out, there are at least 31 variables that affect coastal erosion, among them: the geology of the subsurface of the beach, the size of the sand grains, the coastal contribution of sediments, the projects for the restoration of sand on the beach, the types of storms and their frequency, the coastal vegetation, the escarpments and dunes further inland, the construction and demolition of dams in the nearby rivers and the history of dredging.

Even if we know how each factor, including sea level rise, works and interacts in causing coastlines to recede, we still won't be able to predict the future as we don't know the order where the factors will occur...on different shorelines the various parameters will have varying importance, over varying time intervals. This is complexity in order.

⁴¹ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

*And it is the reason why the retreat of the coastline in 29 in relation to the rise in sea level can never be accurately predicted.*⁴²

The complexity in the order can make some management predictions absurd. Pilkey and Pilkey-Jarvis cite, as the most far-fetched example, the US Department of Energy's Overall Performance Assessment of Systems (EFTS) for the proposed Yucca Mountain nuclear waste repository in Nevada. The result of the evaluation of the possibilities of radioactive leakage from the underground store, based on hundreds of models, is that it will be safe for more than a hundred thousand years. However, as these authors point out, there are at least 15 important factors that will affect the severity of future leaks. None of these factors were known when the EFTS was carried out and many others will never be known.

In 2009, the United States Environmental Protection Agency issued an order requiring the Department of Energy (DOE) to strictly limit the amount of radiation emitted by facilities to no more than 15 millirems per year for the first ten thousand years after their closure, and required the DOE to demonstrate that the nuclear waste repository will withstand earthquakes, volcanic activity, climate change and container leaks for a million years. This risk-assessment nonsense only stopped when Congress decided to stop work on Yucca Mountain in 2011 for political reasons. It remains to be seen if they will be resumed.

Order complexity is only one of two types of complexity that make long-term predictions and assumptions used in planetary management unreliable. The other is structural complexity. The pioneer in studying the dangers of structural complexity was Charles Perrow, emeritus professor of sociology at Yale. Using the well-studied accident at the Three Mile Island Nuclear Power Plant in 1979 as a model, Perrow showed how the sheer complexity of the nuclear power plant made the accident inevitable and unpredictable—"normal."

The operating system of a nuclear power plant has a large number of different subsystems, many of which interact in ways that cannot be directly observed and in ways that could not be understood even if observed. In addition, operating systems interact with security systems, which are themselves complex and often cannot be directly observed either.

In his book *Normal Accidents: Living With High-Risk Technologies*, Perrow describes how the Three Mile Island accident was caused by the failure of a pressure relief valve, which resulted in radioactive water boil, exit the reactor, and spread across the floor of the reactor building.⁴³ This could only be indirectly determined by the control room operators through various gauge readings; meanwhile, three audible alarms sounded and, simultaneously, many of the 1,600 lights on the control panels

⁴² "DNR" in the original. "Department of Natural Resources". *N. from trans.*

⁴³ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

flashed. Only 13 seconds elapsed between the moment the valve failed and the moment the accident became inevitable. The scene in the control room was in chaos.

Several hours after the accident began, control room staff and supervisors were still arguing about what was going on. The valve stayed open for two hours and twenty minutes until a new shift came in and someone thought to check it out. However, the accident was only beginning. Two reactor coolant pumps stopped working (possibly because of steam bubbles inside the pipes) and coolant levels began to drop alarmingly; the scariest thing that can happen in a nuclear power plant. The two gauges indicating the pressure in the reactor gave diametrically opposite readings.

Then, thirty-three hours into the accident, a disturbing bang was heard from the control room. It was a hydrogen explosion inside the reactor building. Nobody expected it. Frantic discussions ensued between the plant operators and the commissioners of the Nuclear Regulatory Commission. Emergency pumps, like any other electric motor, can produce sparks; if the hydrogen built up, a spark could cause an explosion that would destroy the reactor building. Should the pumps be turned off or should they be allowed to continue running? Opinions diverged. That an explosion did not occur was largely a matter of luck.

Given the enormous complexity of nuclear power plants, including, paradoxically, their safety systems, the operators did not really know what was happening while the accident was taking place. However, they had to do something. In these types of situations, Perrow points out, one forms a mental model of the events. You figure out what's going on based on the inadequate and partly wrong information you have. "You are actually creating a world that is consistent with your interpretations, even though it may be the wrong world. It may be too late before one discovers this."⁴⁴

In other words, the complex systems we invent to manage and run the world cannot be built to fail-safe. And if we add economic and ecological interactions, the systems we build become even more complicated and susceptible to accidents.

Here's an example: On April 20, 2010, in the Gulf of Mexico, the *Deepwater Horizon* oil rig suddenly burst into flames. As Joseph Tainter and Tadeusz Patzek relate in their book *Drilling Down: The Gulf Oil Debacle and Our Energy Dilemma*:

*Everything seemed to be under control, with the computers in command and their sensors humming. The people assigned to observe these computers, and to act on their instructions, were happy and ready to go to sleep. ...Suddenly, all the demons were unleashed and it became clear that the people looking at the computer screens did not understand what the computers were telling them. It only took a few seconds for their false sense of security to vanish in the very flames that would consume the Deepwater Horizon in two days.*⁴⁵

⁴⁴ "National forests" in the original. *N. from trans.*

⁴⁵ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

When the flames were extinguished, the accident was still far from over. Several months later, the well was finally able to be sealed. By then, an estimated 210 million gallons of oil had already been spilled into the Gulf. Various attempts were made to contain the oil or mitigate its effects. The latest technologies were used. However, several years later, we still do not know the long-term effects this accident will have on the thousands of species that live in the immensely complicated ecosystem of the gulf or on the human communities on the adjacent land areas.

Tainter, a professor in the Department of Environment and Society at Utah State University, and Patzek, Chair of the Department of Petroleum and Geosystems Engineering at the University of Texas, discuss in detail the causes of the accident. At the end of their book, they come to the following conclusion:

The one with the Deepwater Horizon was a normal accident, a systemic accident. Complex technologies have... ways of failing that we humans cannot foresee. The probability of similar accidents may now have been reduced, but it can only be reduced to zero when declining [energy yields] make offshore oil production no longer energetically profitable. It is fashionable to believe that we will be able to produce renewable energy with kinder technologies, with simpler machines that do less damage to the earth, the atmosphere and people. We all hope so, but we must approach these technologies with a dose of realism and a 33

*long-term perspective.*⁴⁶

Three Mile Island and the Deepwater Horizon teach us a simple lesson: we cannot predict every accident that will happen in our managed world; and even if we could predict them, we couldn't prevent many of them from happening. Disasters are bound to happen in our complex systems, and techno-utopian models offer no credible ways to fix them.

Other concerns associated with global management

Successful global management necessarily requires dealing with other problems than those listed above. I will briefly describe some of them:

Ecological restoration and preservation: In some cases, restoration of damaged ecosystems is possible if done with care and ecological awareness; in others, it may be difficult or impossible. Restorations often fail due to ignorance about the species that are part of particular ecosystems and about their complexity, due to the extinction of previous species, due to major changes in soil or water, and due to a lack of sufficient funds to perform the restoration properly or to follow up on the restoration after it has been completed.

Preservation can be just as difficult as restoration. The movement of species threatened by climate change to areas with a more favorable climate ("assisted colonization")

⁴⁶ "Wilderness way" in the original. "Wilderness" is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as "wild nature". Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

and attempts to reintroduce recovering populations of endangered species to their original habitats are hampered by the limitations of our knowledge of the ecosystems. This is not a reason to abandon attempts at restoration and preservation, but it should make us think twice before bragging about how green our coming garden planet will be.

Maintenance of an adequate supply of clean fresh water: this supply will be essential for sustainable global management; it is not materializing today, and affordable technologies that will guarantee water to everyone are not on the horizon, especially in the face of climate change. International struggles over water management are complicating already tense political relations in the Middle East, South Asia and parts of Africa today. Water will undoubtedly be one of the great obstacles to achieving a managed planet.

Population growth: Increasing populations require more space, more food, more water, more mineral resources and more energy than stable ones. The Earth's population is growing: estimates published by the United Nations (UN) in June 2013 suggest an increase from the current 7.2 billion to 9.6 billion in 2050.[34] Population growth models are no more reliable than any other long-term prediction involving thousands of variables (weather, sea levels, disease, ethnic conflict, war, economic change, etc.) and this unreliability will greatly increase the difficulty of managing a landscaped land. One thing to consider is that per capita consumption is growing more than twice as fast as the population in many countries around the world.

Coordination between nations: a managed world implies coordination between nations that really works well. The Convention on International Traffic in Endangered Species of Wild Fauna and Flora (CITES⁴⁷) demonstrates that this is occasionally possible.⁴⁸ In 2013, 178 nations had ratified the agreement, which protects - at least on

⁴⁷ Acronym in English for "Convention on International Trade in Endangered Species of Wild Fauna and Flora." *N. from t.*

⁴⁸ "Wise-use movement" in the original. The "Wise Use" movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the

paper - thousands of species of animals and plants from overexploitation. With a few exceptions, this protection has been moderately successful. However, a great weakness of this treaty is that the signatory countries can show reservations (exceptions) for specific species. Iceland, Japan and Norway have made exceptions allowing them to hunt some species of baleen whales⁴⁹, and Saudi Arabia has made falcons an exception. CITES is an encouraging model; however, the proliferation of regional military conflicts, terrorism, and ethnic and religious conflicts, resource depletion, and political instability do not bode well for cooperative management of the planet.

I have individually considered the various threats to the neo-green stance but, of course, they interact, usually making the situation worse. For example, the scarcity of cheap energy affects modern food production and water supplies, while leading us to rely on increasingly dangerous energy technologies, which are prone to accidents that we are unable to predict. Similarly, climate change has a major impact on food, water, international relations and energy use.

Conclusion

In short, the above paragraphs offer only a sketchy sampling of the reasons why many of the neo-greens' and eco-modernists' dreams of planetary stewardship are likely to turn into nightmares. In his chilling short story "The Machine Stops," written more than a century ago, EM Forster described the chaos and utter collapse that descend on a managed world when the "Repair Machine" itself, which always fixes everything that breaks, he himself begins to fail: "Man, the flower of all flesh, noblest of all visible creatures, man, who once made god in his own image and likeness...was dying, strangled by the cloth that he himself had woven." [36]

The dream-to-nightmare scenarios outlined here do not have to come true. We *can* keep trying to make the world a better place, using whatever safe technology is proven or shows promise. For example, we already know that traditional polycultures can reliably produce larger amounts of food year after year than monocultures, with fewer inputs of chemical fertilizers and pesticides. The field is wide open for the careful application of modern scientific research to improve this performance even further. And, in the case of our energy deficit, reducing consumption is safer, easier, faster and more effective than offshore oil drilling or nuclear power.

Wendell Berry wrote in *The Unsettling of America* that "what has brought the Modern World into being is a strange and almost hidden longing for the future, as the

American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

⁴⁹ "baleen whales" in the original. It refers to the whales that have baleen instead of teeth, that is, the mysticete cetaceans. *N. from t.*

medieval mind longed for Heaven.”⁵⁰ This longing, embodied in the blind worship of technology, has led us down the wrong path: if we open our eyes and take a look at who and where we are, we will have the best chance of figuring out where to go next. I end by quoting, from my book *The Arrogance of Humanism*, published in 1981, some words that I believe are as applicable today as they were the day I wrote them:

Not all problems have acceptable solutions... There is no... need to feel defeated knowing there are limits to human power and control. ... [We must begin] with an honest admission of our fallibility and human limitations and, on this realistic basis, [assume the] challenge of building a good life for oneself, one's family and one's community. We simply start with realism and then free the human spirit for the great adventures and struggles and for a 38 unknown future.[38]

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⁵⁰ “Between villages there is a death zone” in the original. *N. from t.*

⁵¹ “Animal and Plant Health Inspection Services” in the original. *N. from t.*

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⁵² "OECD" in the original. Probably Organization for Economic Cooperation and Development. *N. from t.*

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Presentation of "OPEN LETTER TO ECOLOGIST COMPANIONS"

The author of the following text is an environmentalist with a strong leftist influence, with all that this implies: mixing ecological problems and the defense of Nature with social problems and the defense of social justice; reduce the techno-industrial social system (or society) to its socioeconomic subsystem; etc. Consequently, some leftist terms and topics appear in the text ("capitalism", "imperialism", "direct democracy", etc.).

Another defect of the text would be the confusion that the author, and with him many other ecologists, seem to have between defending "life" and defending the wild. What is in danger of disappearing due to industrial technological development is the wild nature of the biosphere and its components (in addition to much of its biodiversity), but not life itself.

Nor is Alex Budd very successful when it comes to giving examples of things that should be given up: video games, heating, "reality shows". Already these trivial examples alone make us suspect that, deep down and despite his criticisms of the industrial system, he does not want to completely eliminate modern technology and surely (like many other ecologists) deludes himself into believing that some kind of intermediate point of evolution is possible. balance between the total and uncritical acceptance of the techno-industrial society and its total rejection. However, as he himself should know and infer from his own reflections and knowledge on the matter, such a point of equilibrium is not possible. If you really want to save wild Nature, you will have to completely eliminate the techno-industrial society, anything else will be insufficient. And therefore, those who really want to save the wild will have to be willing to give up, if necessary, much more than video games, TV or central heating.

The author makes the following statement in the text: "Those systems that are destroying the planet [...] must be strategically dismantled and replaced by independent cultures, based on direct democracy and fully integrated into their basic territories and ecosystems. local". Unfortunately, even among the majority of those who criticize more or less correctly the techno-industrial society and clearly see the ecological damage that it entails, it is common to fall into this error: proposing the implementation of alternatives, utopias, "better" societies, etc. that replace the present society instead of simply proposing its elimination, its destruction. Proposing alternative social models that replace the techno-industrial system is a mistake, for at least two reasons. First, it would be impossible to put such models into practice without deviating greatly from the

initial plan. The projects of utopian societies never turn out as their planners expected and wished. In the end, the remedy (new model of society created) usually ends up being equal to or worse than the disease (pre-existing society). And second, these projects of new societies usually set goals, that is, social models, which by themselves, even if they could be achieved exactly and without deviations or perversions with respect to the original ideal models, would not be exactly stupendous. (Except perhaps for those who plan and promote them, and sometimes not even that). Often, these utopias or ideal social models are totally incompatible with human nature, in particular, and with wild Nature in general. In the case at hand, we doubt that when the author says "completely integrated into their local territories and ecosystems", he knows what he is really referring to. What exactly does it mean for a culture to be "fully integrated" into the ecosystems it inhabits? What is simply "sustainable" or what also *effectively* respects the wild nature of Nature? Is it really possible for a human culture to fully integrate into wild ecosystems? And, in such a case, what would be the maximum degree of technological and demographic development that it should have to be able to do so? Is the author thinking only of small nomadic hunter-gatherer communities or (also) of large "green" populations based on agriculture and urbanization (and perhaps even even more modern features and technologies)?

Even so, the text seems to us to have a remarkable value as a sample of one of the few existing serious critics of renewable energies. In this aspect, the author hits the nail on the head when he points out the defects and falsehoods of "clean" energies.

OPEN LETTER TO FELLOW ECOLOGISTS

By Alex Budd[a]

The earth is not dying, it is being killed. And "clean energy" only makes the situation worse.

I should probably start by introducing myself. My name is Alex and I am a long-standing advocate for renewable energy on the mend. For years, I was a victim of despair and hope; I made requests and dialogue, shouted slogans and campaigned; was brimming with enthusiasm at the prospect of "green jobs" and an "economy based on renewable energy". I still see a good part of myself in many of you.

I know what it is. I know exactly what it feels like to look around and see a world that is not only dying but being suffocated, tortured and mutilated, sacrificed on the altar of profit and production. Like many young people today, I know what it is to fear the future, to fear for *my* future. I, like many of you, have read all the studies and reports that are needed to know what is coming; what a mess, completely out of control, galloping on our heels already.

I know what it's like to want to escape, to find a way out of this desert of despair to something, anything, that takes us off the fatal course our society is following, some simple solution, the kind of sane idea that even a politician could support.

Like many of you, I have thought for years that “clean energy” was the answer to the despair that weighs ever more heavily on our collective shoulders and consciousness every day. It seemed realistic. It seemed doable. It seemed pretty. And, most importantly, I believed that it would save the planet.

And I was completely devoted to her. When I was 14 years old, I joined Project Clima[b] as a volunteer, a grassroots organization for education about the

[a] Translation by Último Reducto of “An Open Letter to Fellow Environmentalists” published on March 29, 2012 on the Deep Green Resistance Colorado web page:

[<https://deepgreenresistancecolorado.org/resistance/strategy/an-open-letter-to-fellow-environmentalists/>][<https://deepgreenresistancecolorado.org/resistance/strategy/an-open-letter-to-fellow-environmentalists/>] *N. of t.* climate change created by Al Gore to “raise mass awareness” about the threat of global warming. I’ve been going into classrooms, churches, and community centers for years, preaching the good news of “green” energy and that what we needed was to elect some compassionate Democrats. He wrote letters to the editor, hoping to inspire people to become climate change-conscious voters. He was going to complain to the city council and organize protests to demand that the authorities replace the local coal-fired power plant with a source of renewable energy more typical of the 21st century.

I could see it in my dreams and in the artistic renderings of would-be promoters. Big white windmills dotted across the rolling plains and meadows, slowly and smoothly carrying out their obedient rotations and revolutions, themselves a clean, green revolution. All buildings could be fitted with solar panels, and to a passing cyclist, the deep blue of photovoltaic devices would spread out like the surface of oceans no longer suffocated by oil. It was pretty.

Unfortunately, none of this was -nor is- true. Those visions and daydreams were - and are - totally alien to reality, since nothing emerges from a vacuum.

My dreams did not include the dozens of migratory birds and bats slaughtered each year by windmills[167], whose deaths cannot be justified by my desire to see “Jersey Shore”[d].

My dreams did not include the fact that sun and wind conditions are always changing and “renewable” generation systems have to be combined with fossil fuel-based generation systems when the wind stops or the sky becomes cloudy.[168][168]

Nor did they include the extraction of the minerals needed to build those magical energy-producing machines, which destroy mountains and landscapes forever, dumping mercury and lead into watersheds.

They did not include the radioactive and carcinogenic waste produced by the manufacture of wind generators, nor the Chinese peasants who have seen their land, animals, and families drop like flies from the pollution.[169]

Nor did they include the inevitable dilemma of an economic system that requires constant and infinite growth on a planet that is actually finite (and thus has finite reserves of gallium, indium, and silicon).

My perfect world was not so perfect; however, for some reason, it didn't want to acknowledge the fact that a world powered by solar and wind power (or hydro or geothermal power, or biofuels, or any of the other potential sources you hear so much about) it would inevitably be a world with a global industrial mining infrastructure, along with all the terrible pollution and problems that come with it. It would also necessarily be a world with global industrial production. And it would be, again inescapably, a world with a global transportation infrastructure.

Now, let's stop for a moment. All of these things are what we've been protesting against, the destructive projects we were already waging—and losing—battles against. Mining, production and global transportation - they are all inherently destructive and polluting.

For the last 5 years, I have been believing in the “inspiring audacity” of renewable energy with a passion that rivaled that of Al Gore or Bill Mckibben.

Now, where does preaching the holy trinity of “wind, solar and hydroelectric” lead us because we believe they offer relief to an already collapsing biosphere?

You call yourselves ecologists; You call yourselves guardians, protectors and defenders against the vagaries of Exxon-Mobil. However, what are you defending? Civilization? The economy? That world of sterile plastic that you call home today?

Or are you defending -with your words, actions and bodies- life? Perhaps, like some of us, you are fighting for a world in which your children can breathe the air and drink the water; a world where their bodies are not bombarded with cancer-causing chemicals from the day they are born. Perhaps what you want is a world without deforestation, a world where forests are recognized for the living communities they are. Perhaps you want a world that is not destroyed, but is more alive with each passing year.

In the words of another former environmentalist on the mend, “destruction minus carbon does not equal sustainability”¹. Destruction minus carbon is still destruction, and it is destruction that industrial civilization is based on.

Erecting wind turbines will not stop the systematic deforestation of the Northwest Coast of North America or the desertification of the Amazon; it will not stop the depletion of freshwater wells in India; it will not stop trawlers from wiping out life in the oceans or from replacing it with plastic; it will not stop Monsanto from doing what it does.

Building wind generators will force us, however, to destroy entire mountain ranges with explosives and bulldozers to obtain the necessary minerals and metals; it will create 5-mile-wide lakes filled with carcinogenic and radioactive sludge that will seep into the ground, poisoning animals and people, and kill millions of birds each year.

¹ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth's Vengeance*, page 38).

Coincidentally, it will also require the construction and maintenance of coal or natural gas power plants, since the constancy of wind production is not reliable.²

Hence I find it hard to see that wind power is going to do ANY good.

The same thing happens with solar.

Blanketing the American Southwest or the Sahara with photovoltaics and littering the world with wires won't stop Arizona cotton growers from pumping every last drop of water from the Colorado River; it will not stop vivisectors from torturing dogs, cats, rabbits, monkeys, and countless other creatures in the name of "progress"; it will not stop the relentless march of cities or the sprawl of development across the world's few remaining wild places.

However, these same solar panels will expand slavery in the Congo.³ They will require[e] a global industrial transport and production infrastructure. They will further promote economic imperialism.[170]

And just like those messianic wind turbines, solar PV output is unpredictable and fickle, meaning we'll have to keep our fossil fuel-based power sources anyway!⁴

It is time to end the lies. It is time to see support for "renewable energy" for what it really is: the continuation of a dominating and oppressive economic and social system that murders and enslaves people throughout the world and is systematically destroying and dismantling life. on earth.

As much as it hurts, it has to be said: Renewable energy will destroy the natural world just as surely as Chevron. There are no industrial or technological solutions to the death machinery of industrial society that is devouring all that is left of the most important and basic life support systems on this planet - our planet.

Before the arrival of industrial civilization on this continent[f], you could breathe the air and drink the water. After only 500 years, each and every mother in the world has dioxin (a chemical normally considered "the most toxic in the world") in her breast milk, 98% of the forests have been destroyed, half of men and one-third of all women today will have cancer⁵, and the Colorado River no longer reaches the ocean. Neither wind farms nor "Solartopía®" are going to fix any of these things.

We cannot afford to waste any more time or energy. We have to face the reality of our situation: that industrial civilization is based on the death of the natural, living world.

For us the question now is, do we want hair dryers or do we want clean water? Do we want HD TVs or do we want migratory birds? Do we want to have ten episodes of

² The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

³ A couple of examples:

⁴ Original title: *The Vanishing face of Gaia*.

⁵ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

“The Simpsons” at our fingertips at the click of a mouse or do we want mountains? Do we want devices to read e-books or do we want a world without lakes of radioactive waste? Do we want our privileged, consumer-based ways of life or do we want a living planet? Because, despite our dreams and delusions, we cannot kill this planet and live on it at the same time.

I’m writing this as an open letter to environmentalists, but if I’m being honest, it’s not really an open letter. Many of you (probably most) will continue to call for these unsustainable forms of energy to be developed, even though you know that doing so is asking for death for migratory birds, unpolluted streams (the very few that remain), Chinese farmers, and, basically, for all that remains of the living world. Many of you do not want a truly sustainable way of life, but to support a functionally unsustainable civilization. In many cases, your salaries and personal identities depend on “clean energy”, and you do not dare to question them. And, to me, this is incredibly sad and heartbreaking, given that I know so many people like that. So this letter is not written for you.

This letter is addressed, with the greatest privacy, to those of you who are like me. To those of you who yearn for a just world, without cancer or lakes of toxic mud; without imperialism or murdered birds. This letter is addressed to those of you who desire a living world, to those of you who know, in your heart of hearts, that the needs of the natural world **MUST** come before the needs of the economic system.

In the end, I can only speak for myself. I know what I have chosen: I have chosen a world that has wild trout and bison. I have chosen a world with mountains. I have chosen a world where I can breathe the air, drink the water, and see the stars at night. I have chosen a world with more monarch butterflies[g] each year. I’ve chosen a world where no one has to die or be killed in order for me to play Fantasy Footballh - and if that means a world without video games (SPANISHER ALERT: it does), then so be it.

Our collective fantasy of renewable energy as the savior coming to forgive us our sins is just that, a fantasy, and whether we want to admit it or not, this way of life is over and “clean energy” is completely incapable of saving it.

Industrialism, with its imperatives of growth and production, must be abandoned. Those systems that are destroying the planet - industrial agriculture, extractive industries (industrial mining, industrial fishing, industrial logging, etc.), fossil fuel-based infrastructure, and exploitative power systems - must be strategically dismantled and replaced. by independent cultures, based on direct democracy and fully integrated into their basic territories and local ecosystems. The Earth cannot afford any other alternative, because any other alternative means letting the dominant culture consume what is left of the natural world.

Preserving life - understanding it in any serious sense of the word - will require ending the presumed right to live in a way that destroys Earth’s living systems. As Lierre Kieth says,

“For ‘sustainable’ to mean anything, we have to accept and uphold the hard truth: the planet comes first. The output produced by the life of a million species is literally the land, air and water we depend on... if we use the term ‘sustainable’ and don’t mean that, then we are fakers of the worst ilk: the kind that allow atrocities to happen while idly watching.”[171]

What do you want? Because you can’t have everything.

Where do you draw the line? Because basically there can be no justice -for human beings or for the earth- in an industrial society.

Where does your loyalty lie?

These are not theoretical questions, they are some of the most important things we need to ask ourselves right now. What is sacred to you: a living world or central heating? Whisper this question to your hearts. It is time to answer it.

And it is time to act on that response, to shape our purpose and forge resistance, to plant our feet firmly on the ground and defend our only home with our lives. Because nothing else will.

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Presentation of "THE GREAT DENIAL"

The size of the human population and its growth are factors that have a very important influence on the destruction and subjugation of wild Nature. Most of the following text refutes much of the arguments that are commonly used to play down overpopulation or even justify it. And it does so from a largely materialistic and ecocentric point of view. This is the reason why we consider this article worth publishing.

However, the text also has some defects, located in the last two points ("Progrowth prejudice" and "The culture of denial"), which are worth commenting on:

The author considers that, basically, the arguments for the growth of the human population (or against its stabilization and reduction) are based on individualism. This is a serious error of approach that leads the author to question even the concept of individual freedom. Unfortunately, this is a widespread misconception; In techno-industrial society, criticisms of the supposedly prevailing "individualism" in said society abound. However, modern techno-industrial society is precisely one of the most collectivist (that is, less individualistic; or even more anti-individualistic) societies in history, and the widespread belief that it is "individualistic" acts as an ideological smokescreen that protects it. . Criticisms of the supposed modern individualism are based on really superficial and simplistic observations of the individual rights and liberties that modern citizens are supposed to have. But these rights and freedoms are generally reduced to aspects that are either innocuous or even beneficial to the techno-industrial system (such as, for example, the various modern forms of artistic or aesthetic expression and entertainment). Basically, individual liberties are reduced to choosing between different trivial options and/or totally framed and integrated into modern society. What is really important, those behaviors that, if freely and massively practiced, would endanger the cohesion and survival of the techno-industrial society, are usually heavily regulated and limited. And, of course, modern society has developed an ideology and morality that reinforce the above, ratifying the behaviors that benefit it and demonizing (branding them as "individualistic", for example) those that harm it, regardless of whether they are really bad or not. . Human beings are not made to live in large social groups or to care for or identify with them naturally. To get us to do it, society has to create a whole legal and ideological apparatus. And the critique of the supposed modern individualism is part of that apparatus. Despite what the author seems to believe, the supposed "right to do what one wants" is not exactly something that occurs in modern society in most cases (at least not in those that really matter).

On the other hand, the reason why many people in this society do not recognize ecological constraints is not so-called modern individualism. Natural conditions do not threaten *true* individual freedom, but precisely make it possible. What they rather threaten is the prevailing false notion of freedom, which is a humanistic and idealistic notion of freedom: freedom understood as the total absence of limits (including natural limits) and/or as the transgression of them. As long as nature continues to be thought of as an obstacle to freedom, instead of being the necessary and inevitable framework for its existence, physical limits will continue to be ignored and the vain belief that they can be overcome without suffering negative consequences.

Finally, the fact that the consequences of the individual actions of human beings negatively affect other beings (human or not) and ecosystems does not justify collectivism (anti-individualism). Putting the collective or common before the individual or particular is not going to prevent a large part of these consequences (in the dubious assumption that they must always be prevented) but rather it is going to add even greater problems (derived from the reduction of true freedom, that is, of the autonomous expression of human nature), as history has shown time and time again. The necessary approach to analyze and deal with the matter is different: it is the social system that generates the problems, not the individuals. In the case at hand, what generates the problems associated with overpopulation is the immense number of people and births, not the natural tendency of individuals to reproduce. Despite what the author states, the fact that an individual or a few individuals decide to stop doing something that negatively affects Nature (in this case, reproduce) does not have appreciable effects *on a global level*. Statistically speaking, one or a few among millions or billions is the same as none. The effect of individual behaviors is only noticeable when they are carried out by a large number of people. The author mentions the “tragedy of the commons” implying that “people, normally, do not take into account the effects that their own decisions and individual actions have on the common welfare”. However, the tragedy of the commons refers to those cases in which a freely accessible common resource is exploited individually, not to the reproduction of individuals. What the author mentions is rather the ultimate cause of problems such as the “tragedy of the commons.” This cause is the same both in the exploitation of free access resources and in reproduction: the frequent human tendency to put their own interests before the common ones. However, this is part of human nature and, as already pointed out, trying to modify its expression with regulations and morality will only lead to more problems. When the population is sparse and dispersed and resources are abundant, there are no tragedy-of-the-commons problems, and there is no need to regulate behaviors that would cause them in other situations. This is the ideal situation, and the goal to be set and the strategy to follow must be in accordance with it.

Therefore, what must be questioned and attacked are large human societies, in general, and techno-industrial society, in particular, not individual behavior. Something that, unfortunately, most critics of overpopulation, such as the author, fail to understand.

THE GREAT DENIAL. DEFLECTING THE PRONATALIST MYTHS

By Sandy Irvine¹

A notable feature associated with human population growth is the large number of people who deny that the number of human beings matters. Across the spectrum of public opinion there is near-unanimity that the notion of overpopulation is either a silly fantasy dreamed up by a few ecogeeks or a passing phenomenon affecting only a few places in the Third World and it will dissipate by itself. In the latter case, it is often thought that it is enough to pronounce the words “demographic transition” for the specter to vanish.

Examples of the mental and moral condition that we could call the Overpopulation Denial Syndrome (SNS) abound. For example, when the first Earth Day was celebrated in 1970, there was considerable concern about population growth, in part due to the writings of ecologist Paul Ehrlich. Since then, the world’s population has exploded, increasing by 1.6 billion people (an increase of 43 percent), and yet on Earth Day 1990 there was virtually total silence on the subject.

The 1992 Earth Summit largely ignored the problems associated with overpopulation. Friends of the Earth, Greenpeace and most environmental organizations barely touch the subject. The political parties, including the “greens”, are silent. None of the guides to a green lifestyle mention overpopulation, even though not having children is the most environmentally significant choice a couple can make.

Behind the silence or ambiguity are anti-abortion groups, pro-growth economists, right-wing “libertarians” and the like, who radically deny the problem. The right-wing economist Julian Simon, with his idea that humans are the fundamental resource, affirms that in the long term, “more people means less pollution”. And there are the religious defenders of the explosive increase in the birth rate². The opposition of the Catholic Church (or, rather, powerful factions within it) to “artificial” birth control is well known, but other religions - including Mormons, Orthodox Zionists, Rastafarians and Muslims - share its devotion to procreation.

Unfortunately, these people are not alone in their mistake. The scientist and former candidate for the US presidency Barry Commoner assures that “to affirm that the growing population in any part of the world is responsible for the deterioration of the environment is a totally false idea” (*Utne Reader*, January 1988). *Many social ecologists, ecofeminists, and liberation ecologists now focus on “reproductive rights,” arguing that every woman should have complete freedom to choose how many children*

¹ Translation by Último Reducto of “The Great Denial. Puncturing Pro-Natalist Myths” according to the version published in *Wild Earth. Wild Ideas for a World Out of Balance* (Tom Butler, ed., Milk Weed Editions, 2002) from the original article that appeared in *Wild Earth* magazine 7, no. 4 (Winter 1997 /1998): 8-17. © 1997 Sandy Irvine. *N. from t.*

² “Religious baby boomers” in the original. *N. from t.*

she wants to have (instead of focusing on, say, offering free contraception and sex education). . The leftist world development magazine *New Internationalist* even says that, “since the population will have to stabilize at merely twice the current number, there seems little reason to worry” (October 1987, *italics mine*). Third World aid organizations like Oxfam categorically denounce those who dare to suggest that population growth could be a causal factor in the rising level of misery in Africa, Asia and Latin America.

Many ecofeminists share this position. The Women’s Environment Network in the UK published a pamphlet challenging the “overpopulation myth”. Some go even further. Farida Akher, in *Depopulating Bangladesh* even suggests that there is a sinister collusion by family planners to depopulate Bangladesh. Similarly, Ynestra King asserts that “overpopulation is a hoax promoted by privileged white males” (*Utne Reader*, January 1988). *Whose Common Future?*, a special issue of the famous green magazine *The Ecologist* published in 1992, suggested that overpopulation was a myth promoted by technocrats (white and male, for that matter). supposed).

Add to the ranks of the pro-natalists the many governments around the world that promote population growth. In 1988, for example, the Quebec government offered a \$500 prize for the first child, \$1,000 for the second, and \$4,500 for subsequent children; in 1989 there was a 6 percent increase in the number of babies born. In Zimbabwe, which experienced one of the world’s highest population growth rates after independence, the government’s health minister attacked family planning as “white colonialist collusion” to limit black power.

Sometimes population growth takes the form of a population race, as in the case of Israel trying to cram as many Jews as possible into its territory in order to match the growing Arab population inside and outside its borders. Other times, stable or even declining birth rates are seen as a sign of national weakness; a fear that often takes the form of warnings against an aging population. In the Czech Republic, for example, there is an anonymously financed advertising campaign encouraging Czechs to produce more children. It erroneously presents the composer Bach with twenty sons.

Those affected by the SNS run across the political spectrum: Marxists, Social Democrats, Conservatives and Liberals all share the same basic faith in industrial growth. They may quarrel over what is the best means - collective planning versus private enterprise, for example - but at the core lies the same idea of techno-industrial progress and the same hostility to the overpopulation thesis.

FALSE IDEAS

The errors of those affected by the SNS are sustained by a rich variety of false assumptions and *non sequiturs*. These misconceptions about population issues crop up in everyday conversation, are recycled by commentators and analysts in the mass media, and make regular appearances in serious textbooks.

Some of the popular fallacies and half-truths that accompany the syndrome are based on bad ecology and an inability to take seriously the mathematics of the situation. Others derive from focusing only on one part of the problem - on birth rates but not death rates, for example. Sometimes blind optimism leads people to regard declines in population growth *rates* as if they were actual declines in population *levels*. The following ten myths are pernicious in the sense that they contain a degree of truth. The pro-natal lobby uses these bits of truth to hide or deny other, more important truths.

Myth 1: wealth is the solution.

The classic myth, defended by social scientists and many others, is that the population problem will be solved only as a result of the economic and social changes known collectively as the “demographic transition”. This theory suggests that as people get healthier and wealthier they have fewer children. This, they say, explains the decline in family sizes in Europe over the last two hundred years. Poverty breeds large families, they say. Wealth, they say, is the best contraceptive.

No matter how popular and pervasive this theory is, it remains a simplistic and skewed view of reality that creates unrealistic hopes for a demographic “happy ending”. The global environment simply could not provide the volume of resources, nor assimilate the consequent pollution, that would be required to generalize the level of wealth characteristic of the materially richest countries. For example, if the world population reaches, as predicted, 11 billion before leveling off and each person is to live like Americans today, in thirty-five years almost half of our twenty-four key minerals would be depleted. Environmental degradation and pollution would reach catastrophic levels.

The same story is repeated at the level of individual countries. The median annual income in Ethiopia today is \$120; at a growth rate of 3 percent, it would take sixty years to raise them to \$700 a year, and by then there would not be a shred of fertile soil left in that country due to population pressure over that period. Despite what the theory of demographic transition says, family planning is beginning to succeed in poor countries like Bangladesh, even if there has not been an overall increase in wealth.

Moreover, the postwar baby boom³ took place during a period of unprecedentedly high per capita consumption, when parents could afford more children. Later there was a shift towards smaller families - as opportunities for easy access to education, careers and wealth decreased⁴. In Britain, in recent decades, the decline in family size has been more pronounced for working-class couples than for wealthier, middle-class couples.

³ The author refers to the period after World War II. *N. from t.*

⁴ The author, who is British, is probably referring here mainly to the United Kingdom and the United States. *N. from t.*

More generally, there are no automatic connections. In Sri Lanka, the average per capita income is \$400 and the family size is 2.5 children. In Libya, average per capita income is much higher - over \$3,000 a year - and yet most women have more than five children. In recent decades, France has gone from a situation of no population growth to one of demographic growth. In Sweden, too, there are signs of a return to larger families.

Despite what the demographic transition theory claims, extremely wealthy individuals often have more children than those further down the economic ladder. Britain's Queen Elizabeth appears to be the world's richest woman, yet she and Prince Philip ignored demographic theory and conceived four children. The late financial shark Sir James Goldsmith was one of the richest men in the world... and the father of eight children.

Finally, in the short period of two generations, the improvement of health and income in countries like India or Turkey has led to faster population growth. It may stabilize, but in the meantime, the population of these countries will have quadrupled, and with it all the problems they face will have quadrupled. As Garrett Hardin and other scientists have shown, increased resource input tends to translate into larger population. In the 1950s, for example, land redistribution in Turkey (a good thing in itself) encouraged previously landless peasants to significantly increase the size of their families. In the case of the herders of the Sahel, the deep wells for the extraction of water dug by donor countries in the decades of the 50s and 60s favored that the herds of goats were bigger, that the marriages were earlier (since the bride prices were paid in animals and it became easier to accumulate the required number) and, therefore, fertility was higher. Disaster soon struck, however, as the region's basic ecological constraints remained the same.

Myth 2: Wealth is the problem.

One way to evade or deny the population problem is to blame the world's misfortunes on excessive consumption by the wealthiest sectors of global society. It is certainly true that a small sector of the world's population in the overdeveloped industrial states consumes an extremely large share of the world's resources and consequently has a disproportionate impact on the global environment and economy. However, this simply shows that such countries are overpopulated and are, to use the cancer metaphor, more cancerous than less profligate nations. This reality does not alter another fact, namely, that the majority of the rest of the people aspire to reach the level of wealth of that minority.

Furthermore, the not-so-rich are already causing unsustainable impacts that most calculations underestimate because official statistics, such as the gross national product record, prefer quantifiable data, especially monetary transactions. The not so wealthy often operate on the fringes or margins of the formal economy and their activities

go unrecorded. The biggest cause of deforestation, for example, is the cumulative impact of small-scale logging carried out by settlers and peasants. However, most of the data refers to the impacts of commercial logging, dam construction, cattle ranching projects and other aspects that are part of the formal economy. Myths often surround these issues, especially the exaggerated connection between “hamburgers” and deforestation (and with this observation I do not mean to exculpate the hamburger barons completely).

Myth 3: Country X has a high population density but does not suffer from famine.

Pro-natalists often point to densely populated yet rich countries, such as the Netherlands or Britain, and sometimes to places that have recently become rich, such as Singapore, claiming that population density is not disastrous. However, the populations of these places can only survive by exploiting the resources of other lands, either as “sources” of raw materials or as “sinks” to dispose of their waste and excess population. Had it not been for the new worlds of America and Australia, the population of the UK would have reached 70 million in 1900.

The density argument is actually rather clumsy, since it ignores the fact that the resource base exploited by a given population often does not coincide with its political borders. The British, Dutch, and other peoples escape poverty and hunger because they largely use “ghost” farmland and fishing grounds beyond their borders while exploiting natural capital (soil fertility, naturally regenerated forests, healthy fish populations, etc.) that responsible people would leave intact for their descendants. In addition, by expanding agriculture and urbanization, they have eliminated both the richness and diversity of flora and fauna that once characterized their territories. The ecological footprints, or rather the ecological footprints, of these societies are immense, both geographically and temporally, and they are enormously unsustainable.

Myth 4: Malthus was wrong, so the neo-Malthusians are wrong.

The Reverend Thomas Malthus was the father of modern fears that population growth will exceed the supply of resources. The population-driven famine he predicted did not come to pass because he did not anticipate refrigeration and other technological advances that make long-distance transportation of food possible from colonized lands.

However, Malthus got a few things right. From his analysis of population and food resources, for example, he predicted that in the next 200 years the human population would grow no more than seven and a half times that of his own time, the first decade

of the 19th century. The actual growth has been five and a half times the population of 1800, a remarkably accurate prediction for someone widely derided for miscalculating. His real success, however, was recognizing that our species is as dependent on the Earth's biogeophysical systems as any other species, something that many people still fail to take into account.

Myth 5: There are more than enough resources.

It is an article of faith among "progressive" people, including major lobby groups and humanitarian organizations, that the real problem is the *misallocation* of resources. The world is a very unfair place, obviously, with the relatively few hogging the majority of the world's resources. In a way, the solution they propose - redistribution of land, food and other resources - may give us a breather.

However, an equitable distribution of available resources will not make the population problem go away. The current expansion, be it in the number of people or in per capita consumption, would gobble up the benefits derived from any distribution of wealth. Studies in Guatemala, for example, show that the benefits of land redistribution would disappear within a generation simply because of population growth and increased demand for land. Even in the oft-lauded Indian state of Kerala, where there has been genuine social progress and the state's population growth rate has been reduced to 1.7 percent, the population will still double in number in just forty-seven years. In other words, the problem of the mismatch between population and resources will reappear in half a century.

Part of this myth is the notion that since resource prices have not risen as fast as predicted (and have even fallen in some cases), there is no need to worry about the availability of resources at all. the future. However, the environmental crisis is not simply about the scarcity of certain resources in the near future, although there are already growing conflicts over rights to water and certain minerals in some regions. In the short term, increased efficiency and the substitution of scarcer resources for more abundant ones are likely to keep factories running.

Prices only reflect the interaction between buyers and sellers within a given market. The wood may sell for a pittance, but its low price does not mean that the forests are abundant or healthy. Our economic system ignores the preferences of those who do not have purchasing power, those who have not yet been born and those who are not physically able to join the bidding (the spotted owls are not exactly famous

for intervening in the timber market⁵⁶). This system also ignores many intangibles, things that cannot be priced: a stable climate, an intact ozone layer, water retention in forested slopes, the existence of species that are not edible or directly usable in any other way. , human health, etc Economists may try to put "hidden" prices on these priceless goods, but such an attempt is usually absurd. In short, trends in energy, food and mineral prices are not a reliable guide to forecasting the future. Basic geology and ecology are more appropriate for this. Furthermore, geologically finite and non-renewable resources will one day be depleted or exploit them will become too expensive; today we are "mining" reserves of water, fish, fertile soil, and forests so extensively that we will probably deplete them long before coal becomes scarce.

A more impressive barrier to resources is the depletion that will occur as a result of attempts to extend to all countries the lifestyles prevalent in rich regions such as Western Europe. If the rest of Asia, for example, were to achieve the same ratio of cars per person as Japan (which is not very high compared to the United States), the number of cars in the world would double. However, the planet is already suffocating with current traffic levels. For China to have the same number of computers per capita as the United States in 1993, an additional 315 million machines would be required. However, already today, computerization is causing many serious ecological problems, such as water pollution around printed circuit manufacturing plants.

The main ecological problem is not short-term scarcity but degradation resulting from the extraction and processing of resources, and from the manufacture, consumption and disposal of goods and services. Our concern for coal, for example, should not be about the size of the untapped reserves but about the consequences of continuing to burn them on a scale similar to the current one.

The earth's crust may contain large amounts of useful minerals. The problem would come from the attempt to exploit them. Mineral processing typically consumes huge amounts of energy and water while producing equally huge amounts of pollutants. The mining and processing of currently mined deposits is already causing extensive damage to soil, water, wildlife and human health around the world, and such damage will only get worse as miners seek to exploit the less accessible and poorer quality sources. The production of one ton of copper from an open pit mine, not a deep mine, creates more than 500 tons of waste. The world's annual production of gold and silver generates about 900 million tons of waste rock. The consumption of the production of uranium fuel that a typical nuclear reactor consumes annually requires the extraction of 100,000 tons of rock to the surface, most of which is dumped in landfills in which 90 percent of the original radioactivity of the energy is preserved. stone. In general, the terrifying

⁵ The spotted owl (*Strix occidentalis*) is a species that a good part of American environmentalism took as a symbol of the fight to save the primary forests of the western United States, since these constitute their habitat. *N. from t.*

⁶ The spotted owl (*Strix occidentalis*) is a species that a good part of American environmentalism took as a symbol of the fight to save the primary forests of the western United States, since these constitute their habitat. *N. from t.*

damage done to nature is not due to mismanagement but is an inevitable consequence of the processing of energy and matter in the human economy.

Myth 6: If waste were eliminated, there would be enough resources to meet everyone's needs.

This is an extension of Myth 5. People rightly mention the colossal waste of resources on weaponry and preparation for war, among many other nonsense. If the energy and raw materials wasted in such destructive activities were devoted to socially useful things like food production and sanitation, there would be enough to meet everyone's needs, this argument goes.

Again, although there is a great deal of truth in this argument, it also contains a great deal of fallacy. It completely confuses the ecological and thermodynamic aspects. For example, although spending on health is undoubtedly more beneficial to human well-being than spending on weapons, building ambulances costs the same as building tanks in nature's ledger. Likewise, ecological processes do not distinguish between fertilizer spread on golf courses and fertilizer used on farm fields.

It might be added that the term *needs* is often left undefined. What is a luxury for one person is a necessity for another. Some see the diversion of military spending as a means of solving the health crisis, others as a way to finance more education, others as money to promote the arts, others as a way to ensure everyone a roof over their heads, others as funds to eradicate poverty, etc.

Myth 7: Putting food production first can end hunger.

A close relative of the Fallacy of Redistribution is the belief that there would be more than enough food to go around if the pie were shared equally. This argument is powerful and widespread, with high-profile advocates such as Frances Moore Lappé. They claim that famine could be eradicated and that any of the dangers arising from overpopulation would be eliminated if the land were devoted first and foremost to growing food. Some go further and claim that if meat consumption were reduced there would be much more food available. They rightly point out that the more conversions the food undergoes (grain to feed cows, for example), the more energy is lost on the way to the table.

Again, this argument strikes a chord. Their influence is supported by the vision of food surpluses being burned or otherwise disposed of to maintain market prices. Many people rightly find it obscene that good farmland is used to satisfy the whims of the rich while people starve next door. Countries like Great Britain and the United

States neither need nor have the right to use "ghost land" in poorer countries to supply themselves with exotic fruit and vegetables, flowers or manifestly dangerous substances such as tobacco or opium.

The Food First argument is persuasive but flawed. It wrongly takes current levels of food production for granted. High-yield agriculture is rapidly undermining its very foundations through depleting and eroding soils, depleting aquifers, reliance on chemical inputs, and other unsustainable impacts with which it is inevitably associated. The necessary adoption of organic farming and other less destructive forms of food production will initially reduce harvests, since fewer inputs (synthetic fertilizers, for example) will mean lower production; at least until soil fertility can be restored.

The Food First argument also ignores the likely decline in the future food supply due to increased pollution and ultraviolet radiation and climate disturbances associated with global warming. With global warming, a rise in sea level could flood some of the world's most productive farmland.

Current, not to mention future, population growth makes even a basic diet for all a difficult goal to achieve. The official goal of the Chinese government is to increase the annual consumption of eggs per person from 100 to 200. Soon there will be 1.3 billion Chinese. Assuming a hen can lay 200 eggs a year, that goal will require 1.3 billion birds. Feeding them would require more than Australia's total grain production.

What's more, dedicating land to the production of any conventionally or organically grown crop (staple or luxury) means fewer natural forests and wetlands and fewer other habitats for wildlife. The Hunan Institute for Forestry Research in China estimates that, for example, the annual growth rate of an additional 28 million people leads to the destruction of 1 to 1.4 million hectares of forest per year. Such habitat conversion is disastrous for biodiversity, of course; but, in the long run, it is also bad for people, since wild or relatively unmodified ecosystems are vital to a healthy Earth, the prerequisite for all human activity - including agriculture.

Myth 8: More people means more workers and more production.

This myth has taken many forms. One of its manifestations was Marx's Labor Theory of Value. More recently, Julian Simon has resurrected it in the form of the People as Fundamental Resource theory. However, the underlying fallacy remains the same. The plain truth is that humans do not create wealth. They transform what the Earth's biogeochemical systems and solar energy put at their disposal. Humanity depends on green plants to carry out the process of photosynthesis. The waste that human activities inevitably create is not disposed of by people but reabsorbed by those same ecological systems. There are geological, thermodynamic, and ecological limits

to all stages of what we arrogantly call wealth creation, and those limits are being transgressed. More people will only increase those transgressions.

This “extra hands” myth also confuses what might be true on an individual or household level, especially in the short term, with overall gains and losses, especially in the long term. A family of farmers could gain by adding one more worker to their fields. However, this extra set of hands could lead to increased forest clearing, grazing more cows and goats, or intensifying farming, which together will lead to more soil erosion as well as fewer resources to farm. non-human species.

Myth 9: Technological innovation makes population growth irrelevant.

A widespread fallacy is the assumption that science and technology have freed human beings from the influences and restrictions to which other species are subjected. Virtually all problems have a solution, they say, most of them thanks to technological innovation. The radical 19th-century writer Friedrich Engels, for example, did not hesitate to assert that the advance of science “is as limitless and at least as rapid as that of population... We are forever safe from the threat of overpopulation.””. This myth has recently been popularized by the American socialist biologist Barry Commoner in his book *The Closing Circle*.

While some people see technology as salvation, others see it - or the forms it has taken - as a source and amplifier of our ecological problems. Think of technomonsters like nuclear power, or carcinogenic and ozone-depleting chemicals like CFCs and PCBs, or of everyday technologies like cars and computers, and look at the huge disruptions to the natural world they have caused.

Reformers will trumpet greater efficiency and more appropriate technology but fail to recognize that all technologies have an environmental impact, so that a growing population with the same per capita consumption ultimately negates the benefits of less polluting technologies and at a lower cost. more efficient use of resources. The potential for technological reform is often grossly exaggerated. Many studies of life cycles, that is, of the impacts of different goods - virgin/recycled, ”natural”/synthetic, renewable/non-renewable - from the extraction of raw materials to their disposal, have shown that differences they are not as large as is commonly assumed. Pollution control does not make pollution go away: it simply shifts pollutants from one form, place, or time to another, perhaps making them safer but often at the expense of increased energy consumption. Pollution is simply a consequence of energy and matter conversions, so it is also related to population levels. Furthermore, the impacts of a growing human population are not limited to the depletion of finite resources or the generation of pollutants. Also important is the general degradation of the environment (soil ero-

sion, deforestation, wetland drainage, hydrological disturbances, introduction of exotic species, etc.), for which contaminant filters and the like do not offer a solution.

Myth 10: Reproductive rights are the most basic of freedoms.

The very mention of population policy brings to light one last myth used by pronatalists, namely, that the freedom to reproduce is the most fundamental of rights. The United Nations Universal Declaration of Human Rights assumes that the individual has an inalienable right to have as many offspring as they wish. In many countries, this has been socially supported, for example, with financial aid that is not limited to the first two children.

However, rights are not abstractions separated from contexts and their consequences. *Rights have real meaning only if the conditions under which they are exercised can be sustained.* Otherwise, they are just a license to create ruin for everyone. In relation to procreation, the inability to adopt reasonable goals and policies has opened a dangerous abyss between power (to reproduce, as well as to move and settle freely) and responsibility (to control family size and avoid overpopulation).

The claim to have the right to reproduce without limits is an arrogant presumption. Indeed, it entails making countless decisions that affect this and future generations, other species, and the Earth's habitats and natural processes without their consent. Furthermore, an unlimited right to reproduce in a finite and interconnected world can only mean the reduction of other rights. Freedom in a finite world is not indivisible. In other words, there are many other freedoms, most of which decrease as the number of human beings increases.

For example, the democratic "weight" of each voter decreases as the number of voters in the electorate increases. Or, to cite a more unlikely example, if everyone in the UK exercised their 'right' to go to the seaside on the same hot summer day, everyone would enjoy four inches of coastline. (Of course, they wouldn't get there because of the traffic jam their large numbers would cause.) The balance between population and freedom can be seen most clearly in cities, where all sorts of planning controls and other restrictions are necessary simply because there are so many people together.

As for examples of extreme measures of population limitation, such as China's one-child policy, it should be remembered that unpleasant as they might be, the alternative - mass starvation and social collapse - would have been much worse. It should also be noted that if China had promoted family planning much earlier (instead of calling it an imperialist stunt, as happened under Mao), there would have been no need to take such drastic measures.

THE PROGRESS PREJUDICE

Although it is possible to refute with reason each and every one of the hoaxes defended by those affected by Overpopulation Denial Syndrome, unfortunately these people cling to deeply held beliefs and do not take into account the proven facts.⁷ Claims that Earth's life-support systems cannot support current human population levels (let alone projected future ones) are at odds with the often unstated articles of faith central to modern society. Ours is a civilization addicted to the notion that unlimited growth is both possible and desirable. As the American biologist Garrett Hardin noted, "growth, change, development, spending [and] rapid renewal [are] seen as goods without limit." These ideas have become ubiquitous in modern times. Futurist Herman Jahn, co-author of the study *The Next Two Hundred Years* (1976) had no doubt that endless growth was possible and that, in the year 2176, people would be "numerous" . . . , wealthy and [would] have control of the forces of nature."

Such notions of progress and human potential have virulent individualism at their base. Egocentric gratification is central to contemporary culture. Symptomatic of this is the rhetoric about personal choice invoked by all sorts of individuals and groups, from the pro-gun lobby to supermarkets that defend their sales of environmentally harmful products on the grounds that they are something It depends on the consumer's decision. Consequently there is a pathological hostility towards anything that threatens the right to do as one pleases. And nothing threatens it more directly than the idea that individuals are subject to ecological constraints, since it affects every aspect of our being and none more than reproductive preferences. The right to procreate without limits - aided by technology if necessary - is considered an inalienable personal right that, it is widely believed, only ecofascists could question.

THE CULTURE OF DENIAL

There are other reasons why many people refuse to tackle the ecological problem, including a decline in general awareness and understanding. Perhaps the most important reason for human narrow-mindedness, however, is what Garrett Hardin originally dubbed the Tragedy of the Commons (although perhaps a better name might have been the Tragedy of Common Decisions). People usually do not take into account the effects that their own individual decisions and actions have on the common welfare: "I am just one person. What difference does my car, my computer, my son, etc. make? Most people do not actively seek to create a world filled to the brim with human beings. Nor is there any sinister organization, something like a Progent Hive, brainwashing or otherwise manipulating people to produce more offspring. Population growth is the product of countless daily individual actions that result in the birth of children, planned or not.

Whatever the motivation and the circumstances, the result is the same: more people. In the next three days, the net increase in human population will be enough to fill a

⁷ "We are arguing with deeply held beliefs, not evidence" in the original. *N. from t.*

city the size of San Francisco. Every year there is another Mexico of mouths to feed and every nine years another India. Yet few people see that the gestation of the macrocosm takes place in the microcosm of individual procreation.

At the time of writing this text there are approximately 5.9 billion people in the world. About 7 or 8 percent of all human beings ever born are alive today. More human beings have been added to the world population in the last forty years than in the preceding 3 million years. In the year 2000, there will be more than 1.5 billion women of childbearing age, the largest number in history. And this figure is likely to fall short.

[...] There is overwhelming evidence that we must reverse these trends if we want the Earth to retain its ability to sustain both our lives and those of the thousands of other species that today are threatened with extinction . Policies for population limitation will benefit women whose health is threatened, their opportunities restricted and their rights violated by the set of economic, social and cultural pressures that act to produce more offspring. Similarly, unemployment, homelessness, traffic jams, demands for education and social welfare services, ethnic rivalries, urban sprawl, conflicts over rural land use, depletion of resources, pollution, the destruction of wildlife... all these problems and more would be less serious and more easily solved if the size of the human population were not so great. Paraphrasing Paul and Anne Ehrlich, whatever your cause, it will be a lost cause if there is not, first, the stabilization of the number of human beings and, later, its reduction.

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Presentation of “Is green growth possible?”

The main value of the text that we present below is that, despite being a text written by academics, it questions the general belief that the material development of the techno-industrial society is or can be independent of the impacts on ecosystems; that is, the belief that a society can produce more goods and services and increase its economic level without at the same time causing more ecological impacts. This alone makes this text a true rarity in these times, in which professional scholars do not usually stand out precisely for their intellectual courage and honesty when drawing logical conclusions from their investigations when they collide with dogmas and tendencies prevailing.

However, it should be noted that, despite its virtues, the text also suffers from some shortcomings and defects. Namely:

- The authors base their conclusions on the models and forecasts of other authors, however, the behavior of complex systems and processes, such as the techno-industrial society or the global climate, is intrinsically unpredictable. None of these studies and models can *exactly* predict the trajectory, state and effects of these systems and processes for a given period, no matter how hard one tries and no matter how many technological resources are applied to the attempt. If only because there will always be missing data (not surprisingly, as authors find that many such models are based on assumptions with no empirical basis; it couldn't be otherwise) and because models are never the same as reality (and therefore arguing about models is not the same as arguing about real facts). And yet it seems that, despite the foregoing and their specific criticisms of these models, the authors continue to place too much trust in their results. Does this mean that then your general conclusions are wrong and that absolute “decoupling” between material growth and ecological impact might be possible? No, what it simply means is that pointing out the flaws and inconsistencies in models that are inherently inaccurate or even useless in predicting *accurately* the future is not the best way to show that *in reality* green growth, sustainable development and decoupling between growth and impacts are a scam. Using these models as a reference leaves the door open for the excuse: “the problem is the imprecision of the models, not the green growth itself”.

- The authors, despite their critical and skeptical attitude towards “green growth” and “sustainable development”, are completely uncritical of things like the green belief that the transition to renewable energy or technological innovation will actually con-

stitute improvements in the global situation and will form part of the path to follow to solve the problems, when in reality technological development is the problem, not the solution. What is lacking in their study is that they have not been able to apply their praiseworthy critical and skeptical spirit and their apparently rigorous empiricism beyond the concept of green growth. They should have paid more attention to the unavoidable impacts, both direct and indirect, which are always inherently associated with technological innovation in general and renewable energies in particular. If they had, their conclusions would surely be even less optimistic.

- The authors seem to want to differentiate between "growth" and "development", following a very widespread line of progressive thought in large green sectors and

"environmentally aware" of the techno-industrial society. However, development, whatever its type (including "moral" development or "spiritual" development, if they exist, or "intellectual" or "knowledge" development), would always imply material growth, because even the nonmaterial aspects of human cultures and behavior have a material basis that needs to be physically nurtured and maintained. That of achieving "social" or "human" development without material growth or negative physical impacts is a tall tale. Here there are only two options: either it grows in all directions, or it decreases in all of them. And in the long run, if what is valued is the preservation of Nature, the only acceptable option is the second, no matter how much it pains some "moral" progressives to think about what they will lose with it on an artistic, spiritual, philosophical level. , ethical, intellectual, civil, etc.

Is green growth possible?

By Jason Hickel and Giorgos Kallis[a]

Introduction

The notion of green growth emerged as a central theme at the 2012 Rio+20 Conference on Sustainable Development and featured prominently in the resulting document *The World We Want* (UN 2012), which simultaneously called in favor of the "green economy" and "sustained economic growth". Green growth has since been a dominant response to increasingly dire warnings about climate change and ecological collapse (Dale *et al.* 2016). As a theory, green growth asserts that continued economic expansion (measured by Gross Domestic Product or GDP) is or can be made compatible with the ecology of our planet. Although this idea has been latent in the rhetoric of sustainable development since the Brundtland Commission and the first Rio Conference, when its first formulations took names such as Ecological Modernization (Ayres and Simonis 1993, Weizsäcker *et al.* 1998) or the Kuznets Environmental Curve hypothesis (Dasgupta *et al.* 2002), green growth theory interprets it as a formal statement.

Green growth theory is currently being promoted by leading multilateral organizations and is taken up by national and international policies. This theory rests on the assumption that absolute decoupling[b] of GDP growth from resource use and carbon emissions is feasible (eg Solow 1973), and that it is so at a rate sufficient to avoid dangerous climate change and other aspects of ecological collapse. This review article examines this assumption and contrasts it with existing empirical data. We asked: How do international organizations define green growth? Does green growth theory (and more specifically, the assumption that absolute decoupling of gross domestic product (GDP) growth) hold up to scrutiny?

[a] Translation by Último Reducto of the article “Is Green Growth Possible?”, published in *New Political Economy* (April 17, 2019). Doi: 10.1080/13563467.2019.1598964.

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[b] “Decoupling” in the original. Other possible and equally valid translations would be “disengagement” or “dissociation”. *N. t.* regarding material production[c] and carbon emissions can be achieved at a fast enough pace) in light of data and forecasts based on existing models? And, in case it does not resist it, what would be the political implications?

Defining green growth

There are three main institutions that advocate green growth theory at the international level: the OECD[d], the United Nations Environment Program (UNEP[e]) and the World Bank. Each of them published flagship reports on green growth around the same time as the Rio+20 Conference. In 2011, the OECD launched a green growth strategy titled *Towards Green Growth*[f]. That same year, the UNPA published a report entitled *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*[g]. In 2012, the World Bank published *Inclusive Green Growth: The Path to Sustainable Development*[h]. During the Rio+20 Conference, these institutions joined forces with the Global Green Growth Institute[647] to create the Green Growth Knowledge Platform[j] as an instrument to promote the green growth strategy around the world .

Each of these three organizations gives a different definition of green growth. The OECD defines it as “promoting economic growth and development while ensuring that natural assets continue to supply the environmental resources and services on which our well-being depends” (2011, p. 18). The World Bank (2012) defines it as economic growth that is efficient in the use of natural resources, clean insofar as it minimizes pollution and environmental impacts, and resilient in the sense that it takes into account natural risks and the role environmental management and natural capital in preventing physical disasters.

The UNPA substitutes the expression “green growth” for that of “green economy”, which it defines as one that simultaneously increases income and improves human well-

being “while significantly reducing environmental risks and ecological scarcity” (2011 , p. 16).

None of these definitions is as precise as might be expected (see Jacobs 2013). As Smulders *et al.* (2014) point out, the concept of green growth is “new and still somewhat amorphous”. The World Bank definition is the weakest. The World Bank claims to “minimize” the environmental impact of growth; but you cannot minimize the environmental impact without reducing the impact below its current levels and, in fact, without still increasing the total impact. The OECD is a bit stronger in that it claims to “maintain” environmental resources and services, although there is no requirement to reduce impact. The UNPA report offers the most rigorous definition as it calls for reducing environmental impact and ecological deprivation, as well as “rebuilding natural capital”.

However, the three institutions agree on what is the necessary mechanism to achieve green growth. The promise is that technological change and substitution will improve the eco-efficiency of the economy, and that governments can speed this process up with the right regulations and incentives. But they differ in the clarity of their claims. The World Bank does not even ask the question of whether policy-led innovations will be enough to reduce environmental impact. The OECD, for its part, clarifies that green growth is only possible if technology becomes efficient enough to achieve the “decoupling” of growth with respect to environmental impact. The UNAP takes this a step further and puts decoupling at the center of the analysis: a key concept in framing the challenges we face in making the transition to a more efficient economy is decoupling. As global economic growth hits planetary boundaries, decoupling economic value creation from natural resource use and environmental impacts becomes more urgent.

The UNEP notes that “recent data indicate a moderate trend towards relative decoupling over time”, but makes it clear that this is not enough: “The central challenge... is to absolutely decouple growth from material and energy intensity” (PANU 2011, p. 15).

Here again, the UNAP offers the clearest - and strongest - definition of green growth aimed at influencing policy, namely that green growth requires an absolute decoupling of GDP from resource use and environmental impact. This is consistent with the ecological literature, which insists that in a context of ecological saturation (Rockstrom *et al.* 2009, Ceballos *et al.* 2015 and 2017, and Steffen *et al.* 2015), it is not enough to simply “minimize” the environmental impact – we must quickly reduce it to safe limits.

This leaves us with the question: is absolute decoupling possible? And, if so, is it possible to do it fast enough to get back within planetary boundaries and stay within them? None of the three reports on green growth offer any evidence that this is the case. However, since the Rio+20 Conference, a number of key studies have emerged that shed new light on this issue. We outline the findings of this empirical literature in the following paragraphs, successively analyzing the two main aspects of decoupling—

resource use and carbon emissions—[648] before discussing their theoretical and policy implications.

Use of resources: is absolute decoupling possible?

The conventional way of measuring the use of resources in an economy is “national material consumption” (NMC)[k], which is the total weight of raw materials (biomass, minerals, metals and fossil fuels) extracted from the national territory, plus all physical imports minus all physical exports. Although the CMN is not a direct indicator of ecological pressure, it is a well-established and widely used approximation in the political literature and presents a strong empirical foundation to serve this purpose (Krausmann *et al.* 2009, p 2703). Van der Voet *et al.* (2004) found that although mass flows of individual materials are not indicative of their ecological impacts, and although impacts vary as technologies change, overall there is a high degree correlation (0.73) between production¹ material and ecological impacts.

To measure the relationship between GDP and resource use, many governments have adopted the practice of dividing GDP by CMN. This gives an idea of the “efficiency of resource use” in an economy. If the GDP grows faster than the CMN (relative decoupling), the economy is becoming more efficient in the use of resources. The GDP/NMC ratio is used by the European Union to assess progress towards green growth. It is also the main measure used in the OECD’s annual report *Green Growth Indicators*.

By this measure, it appears that many nations have achieved relative decoupling, with GDP growing faster than NMC. In the 2017 edition of *Green Growth Indicators*, the OECD concluded that “material productivity has improved in some OECD countries” (45). The report also indicates that the European OECD nations have achieved full decoupling, with GDP growing while NMC shrinking. Non-energy material consumption in the OECD fell from 12 tons per capita in 2000 to 10 tons per capita in 2015, with a downward trend that started after the 2008 financial crisis (it should be noted, however, that the version of the OECD CMN does not include fossil fuels; this is not a normal practice in the literature on material flows). These data are the key to optimistic narratives of green growth and underpin the popular notion that we have reached the “material peak” (eg Goodall, 2011, Pearce, 2012).

However, the CMN is a problematic indicator, since it does not include the material impact of the production and transport of imported goods (Wiedmann *et al.* 2015, Gutowski *et al.* 2017). *In a globalized economy, in which rich countries have shifted much of their production to poorer countries, this aspect of material consumption has been removed from their balance sheet. If we bring it back in, looking at the full impact of any nation’s resource consumption (what Wiedmann et al. refer to as a “material footprint” or HM[m]), the picture changes. . Wiedmann et al. show that while the US, UK, Japan, OECD and EU-27 have achieved a relative decoupling of GDP from NMC (including fossil fuels), the material footprint has been growing at the same rate or greater than GDP, which suggests that no decoupling has occurred; in*

¹ “Throughput” in the original. *N. from t.*

fact, in most cases what has occurred is a recoupling[n] (see Figure 1). The OECD's Green Growth Indicators partially acknowledges this problem, stating that "progress is moderate when indirect flows relative to trade are considered". However, the report does not offer any data on indirect flows; and the available data suggest that progress has not been moderate but rather negative.

According to Wiedmann *et al.* (2015), the only significant cases of relative decoupling of GDP from material footprint have been China, India and South Africa.

South Africa is the most notable case of the three, with close to zero growth in material footprint since 1990, though without any evidence of sustained absolute decoupling.

On a global scale, resource use has been growing along a fixed path. Krausmann *et al.* (2009) show that the global extraction and consumption of materials (including fossil fuels) increased eightfold during the period between 1900 and 2005, reaching 59 billion[o] tonnes[p] per year and growing at annual rates of between 1 per cent and 4 per cent. Giljum *et al.* (2014) found that global consumption grew by 93.4 percent between 1980 and 2009, at an average rate of 2.4 percent per year, to a total 67.6 billion tons[q].² Materialflows.net (2015), which is run by the Vienna University of Economics and Business, provides data for the period from 1980 to 2013 and shows that the global material footprint grew by 132 percent, at an average rate by 2.5 percent per year, reaching almost 85,000 million tons[r] (Figure 2(a)).

What is the relationship between global GDP and resource use? Krausmann *et al.* (2009) show that during the 20th century GDP grew at a faster rate (3 percent per year) than resource use (2 percent per year). This represents a relative decoupling or dematerialization of GDP growth, at a rate of about 1 percent per year. However, this changed in the 21st century: the pace of global consumption growth increased between 2000 and 2005, averaging 3.7 percent per year. Since this equals or exceeds the GDP growth rate, no decoupling was achieved. Giljum *et al.* (2014) also found that the growth rate of global consumption accelerated in the 21st century, averaging 3.4 percent per year between 2000 and 2009; again, no decoupling was achieved. Wiedmann's global data shows a similar trend. Materialflows.net (2015) shows a period of moderate growth in the footprint

[o] "Billion tons" in the original. Although in the UK "billion" can sometimes literally mean "billion" (i.e. a million million; 10^3), in the international English scientific literature "billion" usually means "one billion" (10^4) not "billion". However, in each of

² Original title: *The Vanishing face of Gaia*.

³ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

⁴ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were

the cases where the term “billion” appears in the original, a footnote has been added indicating the original amount in English. *N. from t.*

[p] “59 billion tons” in the original. *N. from t.*

[q] “67.6 billion tons” in the original. *N. from t.*

[r] “85 billion tons” in the original. *N. of t.* global material between 1980 and 2002, at 1.78 percent per year. Since this was slower than the GDP growth rate, some relative decoupling was achieved. However, the final decade from 2002 to 2013 shows an acceleration in global material use, to 3.85 percent per year.⁵ Global material use increased faster than GDP during this decade. In other words, in the 21st century the material intensity of the world economy has been increasing, not decreasing. The authors state: “Today, the world economy is therefore following a path of rematerialization and is far from any decoupling -even relative- ”. (Figure 2(b)).

In summary: global historical trends show relative decoupling but do not show any evidence of absolute decoupling, and 21st century trends do not indicate higher efficiency but rather lower efficiency, even recoupling. Of course, potentially future trajectories could break with these trends if we changed the composition and technology of the global economy (Grossman and Krueger 1995). What does the data say about forecasts for the future?

One theoretical possibility is that resource intensity declines as economies shift from manufacturing to services. However, historical data does not support this theory. The share of global GDP made up of services has grown from 63 percent in 1997 to 69 percent in 2015, according to World Bank data. However, during this same period the global use of materials has accelerated, outpacing GDP growth. The same is true of nations with high incomes. Services account for 74 per cent of GDP in high-income nations (growing from 69 per cent in 1997), but the MNC has not declined and the growth of⁶ material footprint is outpacing of GDP. This may be because services are resource-intensive (in other words, services incorporate significant amounts of materials) or because revenues from selling services are used to buy resource-intensive consumer goods (Kallis 2017). Another possibility is that the resource intensity of the primary and secondary sectors has increased to such an extent that it outweighs any gains from the shift to services. Whatever the cause, there is no historical evidence that a shift to services, in and of itself, will reduce the material output[t] of the global economy.

said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (The Earth Runs Out , page 237).

⁵ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁶ “Constant 2010 USD” in the original. *N. from t.*

Another theoretical possibility that is often raised is that technological innovation and government policies could bring decoupling in the future. This is the assumption suggested by the World Bank, OECD and UNAP green growth reports. To our knowledge, there are three main studies examining this possibility on a global scale. We will discuss their findings below.

Dittrich *et al.* in 2008 to 180 billion tonnes[651][652][653][654]⁷ in 2050. This scenario assumes that the global economies of the South will grow to a point where average global consumption per capita in 2030 will match the OECD's per capita consumption in 2008. Dittrich *et al.* conclude that this level of resource use is “not an option for the future”. For its part, its optimistic scenario assumes (a) medium population growth; (b) that all countries will carry out the best practices regarding efficiency in the use of resources; and (c) that the reduction in the consumption of one material will not require a greater consumption of another. In this scenario, resource use will reach 93 billion tonnes[y] in 2050. This represents a relative decoupling, but not an absolute reduction in material use.

In a second study, Schandl *et al.* (2016) use a model based on an average annual growth of global GDP of 3 percent and explore three scenarios between the years 2010 and 2050. The reference scenario, without significant changes in environmental policies, shows that global resource use will grow from 79.4 billion tonnes[z] in 2010 to 183 billion tonnes[aa] in 2050 (similar result to Dittrich *forecast et al.*), with a slight relative decoupling. The “intermediate efficiency” scenario, with a carbon price of \$25 per tonne of CO₂ (increasing 4 percent per year), shows that global resource use will still grow steadily over that period, but at a faster rate, which will be about half the rate of GDP growth, reaching 130 billion tonnes[bb] in 2050. The “high efficiency” scenario, which starts with a carbon price of \$50 (increasing 4 percent a year to \$36 in 2050) as well as doubling the material efficiency of the economy (from historical improvements of 1.5 percent per year to 4.5 percent per year), shows that global resource use is still it will continue to grow steadily, but at about a quarter of the growth rate of global GDP, reaching 95 billion tonnes[cc] in 2050 (again, the results are similar to those of Dittrich *et al.*).

It is important to note that the rate of improvement in material efficiency that Schandl *et al.* assume (ie 4.5 percent per year) lacks any empirical basis. They provide no evidence that it is possible to maintain such a fast pace. However, even with this optimistic assumption, Schandl *et al.* come to the following conclusion: “Our research shows that while some relative decoupling can be achieved in some scenarios, none will lead to an absolute reduction in . . . the material trace”.

Finally, the UNPA has developed a model that explores four different future scenarios, which are discussed in its *Assessing Global Resource Use* report (PANU 2017a, pp. 42-45). Their baseline scenario, extrapolating from existing trends, shows that global resource use will grow steadily from 85 billion tonnes in 2015 to 186 billion tonnes in

⁷ “180 billion tons” in the original. *N. from t.*

2015 (similar result to Dittrich *et al.* and Schandle *et al.*). His high-efficiency scenario, by contrast, includes stringent policy measures: (a) a global carbon price of \$5 per tonne of CO₂ in 2021, rising 18.1 percent a year to \$573 in 2050 ; (b) technological innovation that improves the efficiency in the use of resources; (c) a tax on resource extraction that increases the price of natural resources relative to other inputs; and (d) progressive changes in government regulations, planning and provisioning (for full details of the model see PANU 2017b, p. 287 ff). The high-efficiency scenario predicts that global resource use will increase to 132 billion tonnes[dd] in 2050. While some relative decoupling is achieved, there is no absolute reduction in resource use.

The UNPA forecasts are significantly worse than what Dittrich *et al.* or Schandl *et al.* predict. The authors of the model, Ekins and Hughes, say that this is because their model has incorporated the "rebound effect" (PANU 2017a, 106 ff.). The rebound effect negates some of the resource efficiency improvements. This happens because such improvements reduce the costs of a good or service, freeing up income and increasing effective demand (see Herring and Sorrell 2009 for a review of the literature on the matter). In light of these findings, the UNAP recognizes that improvements in resource use efficiency will not be enough, in and of themselves, to achieve sustainability, or green growth. "Efficiency in the use of resources is not enough. Productivity increases in the current linear production system will most likely lead to an increase in material demand through a combination of economic growth and rebound effects" (12). Instead, the report acknowledges that something else is needed. They suggest further research into the principles of a circular economy: "a shift from linear material flows to circular material flows through a combination of extended life cycles, intelligent product design, and standardization, reuse, and remanufacturing" (12). Improving circularity could reduce the ecological impact of material production[ee], but only a small part of the total production[ff] has circular potential. 44 percent of production

[cc] "95 billion tons" in the original. *N. from t.*

[dd] "132 billion tons" in the original. *N. del .t.*

[ee] "Throughput" in the original. *N. from t.*

[ff] *Idem. N. of t.* is made up of food and energy inputs, which are irreversibly degraded, and 27 percent is made up of the net addition to building and infrastructure construction (Haas *et al.* 2015).

These models suggest that absolute decoupling is not feasible on a global scale in the context of continued economic growth. However, they are global studies. It might be objected that, when trying to assess the question of whether green growth is possible, one has to look at what concretely high-income nations might be able to achieve, given their greater capacity for technological development. Hatfield-Dodds *et al.* (2015) have modeled a series of scenarios for Australia from 2015 to 2050, with results that have been widely cited in support of green growth theory. Their most optimistic scenario assumes a high degree of politically promoted efficiency gains, with a 70 per cent drop in the intensity of material use. The authors consider that "substantial economic and physical decoupling is possible," with GDP increasing at an average rate of 2.41 percent

per year "as corresponding environmental pressures (greenhouse gas emissions, stress water, loss of native habitats) are reduced". The model suggests that this can be done without externalizing the environmental impact to other countries.

However, Hatfield-Dodds *et al.* have been criticized for this model. First, they offer no evidence for their assumption that a 70 percent drop in material intensity is possible. Alexander *et al.* (2018) have pointed out that this rate of efficiency improvement is baseless and unrealistic. In fact, the Australian Department of Agricultural Economics (DAEA[gg] 2008) reports that future efficiency will most likely improve by only 0.2 to 0.5 percent a year - at most an eighth of the rate that Hatfield-Dodds assume. Second, even if a 70 percent drop in material consumption intensity were possible, it seems that any resulting reduction in resource use would only occur for the short term. The optimistic scenario of the Hatfield-Dodds *et al.* model shows that material use decreases from 2015 to 2040, but then begins to increase again.

Ward *et al.* (2016) have tested the Hatfield-Dodds model for a longer period, up to 2100. They assume a drop in material use intensity by 2050 to be a 50 percent higher than that proposed by Hatfield-Dodds *et al.*, to make it an even more optimistic scenario. They have found that material extraction declines until 2050 (decoupling at an average rate of about 4 percent per year) but then it will level off and then grow steadily so that by 2100 material use will be between 20 percent and 60 percent higher than it was initially in 2015. While absolute decoupling for material extraction is achieved in the short term, for the longer term material extraction increases by 2.16 percent per year, almost matching the rate of GDP growth. Note that the "extraction of materials" indicator is different from both the CMN and the material footprint, since it does not include imports; the CMN and material footprint values for Australia would be significantly higher (Figure 3).

[gg] "Australian Bureau of Agricultural Economics" in original. The acronym appears as "ABARE" in the original. *N. del .t.*

Ward et al. They state:

For non-replaceable resources such as land, water, raw materials, and energy, we believe that while efficiency gains may be possible, there are minimum requirements that are ultimately dictated by physical facts: for example, the limit photosynthetic for plant productivity and the maximum trophic conversion efficiency for animal production dictate the minimum amount of land required for agricultural[hh] production; physiological limits to the efficiency of water use by crops dictate the minimum use of water in agriculture; and the upper limits of energy and material efficiencies dictate the minimum amount of resources necessary for economic[656] production.

As the physical limits of resource efficiency are reached, continued GDP growth causes resource use to rise again. Ward *et al.* conclude that "the decoupling of GDP growth from resource use, whether relative or absolute, is only temporary at best. Permanent decoupling (absolute or relative) is impossible for non-substitutable essential resources as efficiency gains are ultimately subject to physical limits. In the end, GDP growth cannot be reliably decoupled from growth in energy and material use, demon-

strating categorically that GDP growth cannot be sustained indefinitely. It is therefore misleading to develop growth-oriented policies based on the hope that decoupling is possible.

Conclusions and discussion

Empirical data suggest that absolute decoupling of GDP from resource use (a) may be possible in the short run in certain rich nations with stringent reduction policies, but only assuming theoretical improvements in efficiency that may be impossible to predict, achieve in reality; (b) not feasible on a global scale, even under the political conditions of best-case scenarios; and (c) is physically impossible to maintain in the long term. In view of these data, we can draw the conclusion that the green growth theory—in terms of resource use—lacks empirical support. We know of no credible empirical model that contradicts this conclusion. However, there are three counterpoints to consider:

First, this conclusion is sensitive to the GDP growth rate taken as a reference. The studies cited above predict growth of between 2 and 3 percent per year. As the growth rate approaches zero, absolute decoupling becomes more feasible and is likely to last longer. It would be reasonable to expect that green growth could be achieved at very low GDP growth rates, that is, less than 1 percent per year—a rate significantly lower than historical trends and projected trajectories.

Second, the studies cited above are based on the relationship between GDP and material[jj] production. They are models of the impact of known variables, such as improvements in efficiency, technological innovation, taxes, the shift to services, etc. However, it could be objected that it is theoretically possible to completely break the relationship between GDP and material production[kk]. In the penultimate section of this article we reflect on this.

Third, it could be objected that the total material footprint indicator hides the possibility of moving from high-impact resource use to low-impact resource use. It is true that different materials have different impacts and that renewable and non-renewable materials have different types of sustainability thresholds, but the joint measure is nonetheless considered a useful approximation since all constituent material categories exhibit more or minus the same trends as the total (that is, they all increase with GDP growth). And, since all materials have some impact, the indefinite growth of any material category is not compatible with ecological principles.

It is important to note that the green growth standard we used above is conservative, since it considers as green any reduction in annual resource use, no matter how small. The academic literature on resource use is significantly stricter than this. The emerging consensus considers that it is necessary to reduce the global material footprint to 50,000 million tons[658]⁸ per year to be compatible with the ecology of the planet (Dittrich

⁸ “50 billion tons” in the original. *N. del .t.*

et al., 2012, Hoekstra and Wiedmann 2014, PANU 2014, Bringezu 2015). Bringezu (2015) goes even further and suggests that this reduction needs to take place before 2050. Of course, there are reasons to be skeptical about global targets like this, because they combine renewable and non-renewable materials that should be treated separately. separately and because the impacts of material use are locally specific and thresholds should be adjusted to local ecosystems (except for fossil fuels and terrestrial biomass extraction, which affect greenhouse gas emissions). Even so, the literature makes it clear that the material footprint needs to be significantly reduced from current levels. In other words, to be truly green, green growth requires not just any degree of absolute decoupling, but absolute decoupling that is fast enough to meet green goals.

Carbon emissions: Is growth compatible with the Paris Agreement?

Unlike resource use, there is a consistent long-term trend towards a relative decoupling of GDP from carbon emissions, and we know that absolute reductions in carbon emissions are possible. When it comes to climate change, however, the objective is not simply to reduce emissions (a question of flows), but to prevent total emissions from exceeding specific carbon budgets (a question of cumulative quantities). Therefore, when it comes to green growth theory, the question is not just whether we can achieve absolute decoupling and reduce emissions, but whether we can reduce emissions fast enough to stay within carbon budgets for 1.5°C or 2°C, in accordance with the Paris Agreement, and still continue with economic growth.

A few high-income countries have seen their emissions decline in the 21st century, despite continued economic growth. Figure 4(a) shows the decline in emissions in the US and the EU28, both territorially and in terms of consumption, from 2006 to 2016 (ie an absolute decoupling). Still, emissions from the global South continued to rise, albeit at a slower rate than GDP (ie relative decoupling). China's emissions fell slightly between 2014 and 2016 (a brief period of absolute decoupling), before growing again in 2017.

At a global level, CO₂ emissions have increased steadily, decreasing only during periods of economic recession (Figure 4(b)). Global emissions stabilized in 2015 and 2016 while GDP continued to grow, prompting the International Energy Agency, a research arm of the OECD, to announce that “The decoupling of global emissions from growth has been confirmed. economy” (IEA 2016), while media headlines celebrated “peak emissions” (Meyer 2016). This news became a key element of optimistic green growth narratives for a short time, until global emissions started to grow again in 2017 (up 1.6 percent) and 2018 (up 2 percent). .7 percent). Analysts attribute the temporary halt to a shift in China from coal to (mainly) oil and gas and a shift in the US to gas.⁹ After these shifts were complete, continued economic growth caused emissions to rise again.

⁹ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

Overall, global carbon productivity has been declining. World Bank data shows that carbon productivity (CO₂ per GDP measured in 2010 US dollars[mm]) improved steadily from 1960 to 2000, with decarbonization occurring at an average rate of 1.28 percent per year (relative decoupling). However, from 2000 to 2014

[mm] “CO₂ per 2010 \$USD GDP” in the original. *N. del .t.* there was no improvement in carbon productivity - in other words, no even relative decoupling has been achieved in the 21st century.[660] High-income nations have fared better, at least in terms of territorial emissions (the World Bank does not look at the trajectory of consumption-based emissions), but even so, progress has slowed, down from a average rate from 1.9 percent per year between 1970 and 2000 to 1.61 percent per year between 2000 and 2014.

Current trends are incompatible with the goals of the Paris Agreement. If business as usual (BAU scenario) there will have been a warming of 4.2°C (from 2.5°C to 5.5°C) by 2100. Even with Nationally Determined Contributions and Nationally Determined Contributions Promised in the Paris Agreement, global warming is projected to reach 3.3°C (between 1.9°C and 4.4°C) - an improvement over the BAU scenario, but still far exceeding thresholds for 1.5°C and 2°C.[661] To keep warming below these thresholds, the world will have to make much more aggressive emission cuts.

selected regions, 1990-2016; (b) Global CO₂ emissions, 1960-2018.

Source: Global Carbon Budget[nn] (2018).

The Fifth Assessment Report (AR5)[oo] of the IPCC[pp] includes 116 mitigation scenarios that are consistent with the Representative Concentration Pathway 2.6 (RCA2.6)[qq], which offers the best chances of remaining for below 2°C. All of these scenarios are green growth scenarios in the sense that global temperatures stabilize while global GDP continues to grow. Increasing GDP is a built-in feature of the Shared Socioeconomic Pathways (SSPs)[rr], which form the basis of IPCC mitigation scenarios (Kuhnhehn 2018). The AR5 warns, however, that these scenarios “imply a temporary saturation of atmospheric concentrations” and that they “are generally based on the availability and widespread use of bioenergy with carbon capture and storage (BECAC)¹⁰” (2014, p. 23). In fact, the vast majority of 2°C scenarios (101 of 116) are so based on BECAC that they reach negative emissions.¹¹ BECAC involves growing large plantations of trees to sequester CO₂ from the atmosphere, harvesting the biomass, burning it for energy, capturing CO₂ emissions at source and storing it underground. Relying on these “negative emissions technologies” allows for a much larger carbon budget (about twice the actual size) by assuming that we will be able to successfully reduce global atmospheric carbon in the second half of this century.

¹⁰ “Bioenergy with carbon capture and storage (BECCS)” in the original. *N. from t.*

¹¹ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

The BECAC has generated much controversy among climate scientists. Obersteiner *et al.* (2001) and Keith (2001) first proposed it in the early 21st century. The teams in charge of creating the IPCC models began to include it in their scenarios starting in 2005, despite the fact that there was no firm evidence of its viability. With the publication of the IE5, the BECAC established itself as the dominant assumption. Obersteiner has expressed alarm at the rapid acceptance of his idea; sees BECAC as what he calls a “risk management strategy” or “backup technology” in case climate feedback loops turn out to be worse than expected, and says the IPCC has done a “bad thing.” use” of it by including it in regular scenarios to take pressure off conventional mitigation pathways (i.e., emission reductions) (Hickman 2016). In Keith’s (2001) initial formulation of the idea, he noted that while ‘managed use’ of biomass could help mitigate environmental problems, ‘large-scale use of cultivated biomass will not do so’.

Anderson and Peters (2016) point out that the “attractiveness” of the BECAC is due to the fact that it allows politicians to postpone the need to rapidly reduce emissions: “The BECAC allows to continue with the combustion of fossil fuels and at the same time fulfill apparently the Paris Commitments”. There are several concerns. First, feasibility. Electricity generation using CCS[tt] has never been proven to be economically viable or applicable on a large scale; it would require the construction of 15,000 facilities (Peters 2017). Second, the biomass scale assumed in the AR5 scenarios would require plantations covering an area two to three times the size of India, raising questions about land availability, competition with food production, carbon neutrality and biodiversity loss (Smith *et al.* 2016; Heck *et al.* 2018). Third, the necessary storage capacity may not exist (De Coninck and Benson 2014, Global CCS Institute[uu] 2015). Anderson and Peters conclude that “BECAC therefore remains a highly speculative technology” and that relying on it is therefore “an unfair and very risky gamble”: if it does not succeed, “society will be trapped in a high-temperature pathway. This conclusion is shared by a growing number of scientists (e.g. Fuss *et al.* 2014, Vaughan and Gough, 2016, Larkin *et al.* 2017 and Van Vuuren *et al.* 2017) and by the Science Advisory Council of the European Academies[vv] (2018).

It is not clear that we can justify reliance on BECAC, an unproven technology, to support green growth theory. If we accept this objection, then we must again ask ourselves whether it is possible to sustain growth without relying on BECAC to stay within carbon budgets consistent with the Paris Agreement. Without BECAC, global emissions need to be reduced to zero by 2050 for 1.5°C, or by 2075 for 2°C.¹² This

¹² “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited

represents reductions of 6.8 percent and 4 percent per year, respectively (Figure 5). In theory, this can be achieved with (a) a rapid shift to 100 percent renewable energy to eliminate emissions from fossil fuel combustion (Jacobson and Delucchi 2011); plus (b) afforestation and soil regeneration to eliminate emissions from land use change; plus (c) a switch to alternative industrial processes to eliminate emissions from cement, steel, and plastic production. The question is, can all of this be accomplished quickly enough?

Only 6 of the 116 scenarios for 2°C in the AR5 exclude BECAC. They operate assuming “fully optimal technology” in all other areas, plus massive afforestation and high mitigation costs. These scenarios represent theoretically possible pathways, but without any empirical evidence of their feasibility.

The results of empirical studies are not promising. Schandl *et al.* (2016) have created a model of what could be achieved with aggressive mitigation policies, without relying on BECAC. His high-efficiency scenario includes a carbon price starting at \$50 per ton (rising 4 percent a year to \$236 in 2050) plus a doubling of the material efficiency of the economy due to technological innovations (improving at from the historical average of 1.5 percent per year to 4.5 percent). Schandl *et al.* do not provide any evidence for the feasibility of the efficiency improvements they assume. Still, the results show that, with global growth of 3 percent a year, annual emissions would level off by 2050 but not decline. In this scenario, energy demand growth outpaces the decarbonization rate, missing the carbon budgets for 1.5°C and 2°C.

The International Association for Renewable Energy (AIER[ww] 2018) has modeled a scenario for continued GDP growth consistent with 2°C thanks to assuming a rapid shift to energy (consistent with Jacobson and Delucchi 2011). The scenario calls for adding 12,000 GW of solar and wind capacity by 2050, with a dramatic increase in installation rates (from 2.3 to 4.6 times faster than today).¹³ The scenario also calls for the energy intensity of the global economy to be reduced by two-thirds (about 2.8 percent per year; twice the historical rate), bringing energy demand down in 2050 to a little less than that of 2015.¹⁴ This is feasible as the transition to wind and solar itself

us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (The Earth Runs Out , page 237).

¹³ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹⁴ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily

improves energy efficiency (Jacobson and Delucchi 2011).¹⁵ Still, even this optimistic scenario achieves only 90 percent of the emissions reductions needed for 2°C (most likely because it ignores emissions from land-use change and cement production). The model relies on negative emissions technology to cover most of the rest of the reductions.

[ww] “International Renewable Energy Agency (IRENA)” in the original. *N. from t.*

Van Vuuren *et al.* (2018) consider “alternative pathways” to meet the goals of the Paris Agreement without relying on the widespread use of negative emission technologies. They have made a model for a growing GDP according to VSC2¹⁶. In addition to a carbon tax and other aggressive mitigation strategies, his optimistic scenario includes the following conditions: global population peaks at 8.4 billion in 2100; meat consumption drops 80 percent by 2050; all new cars and planes are efficient from 2025; the world adopts the most efficient technologies for the production of steel and cement; etc. Even including these wildly optimistic assumptions, they find that continued growth pressures will cause emissions to exceed carbon budgets for 1.5°C and 2°C, without negative emission technologies.

Another way to approach this question is by looking at the expected rates of decoupling. If we assume that global GDP continues to grow at 3 percent per year (the average for the years 2010 to 2014), then decoupling should occur at a rate of 10.5 percent per year for 1.5°C, or 6.4 percent per year for 2°C. Both objectives go beyond what existing empirical models indicate as feasible. The Schandl *et al.* model indicates that decoupling can occur at a rate of as much as 3 percent per year assuming optimistic conditions. Other models reach similar conclusions. Prior to adopting BECAC-based assumptions, the PICC (2000) anticipated a decoupling of 3.3 percent per year in the best-case scenario. The C-ROADS tool (developed by Climate Interactive and the MIT Sloan School) predicts a decoupling of at most 4 percent a year under the most aggressive reduction policies: high subsidies for renewables and nuclear power, plus high taxes on oil, gas and coal. All of these results do not reach the rate of decoupling that must be achieved if the global economy continues to grow at the expected rate. Holz *et al.* (2018) have found that, if we rule out the widespread use of negative emissions technologies, the rate of decarbonization required to meet the Paris Agreement is “well above what is currently considered achievable, based on historical evidence and standard models.

The challenge is even more difficult for rich nations. Anderson and Bows (2011) have modeled the emission reductions needed to have a 50 per cent chance of staying below 2°C (a more relaxed chance than the two-thirds chance required by the UNFCCC[yy]).), without BECAC. They are based on the principle of “common but differentiated responsibility”, whereby rich nations (Annex 1 nations) make more aggressive emission

rewarding and brought them fame and fame. funds beyond what they could have imagined.” (Earth’s Revenge, page 166).

¹⁵ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹⁶ “SSP2” in original. It probably refers to the second of the so-called “Shared Socioeconomic Pathways” or “Shared Socioeconomic Pathways”, so it has been translated here as “VSC2”. *N. from t.*

reductions than poor nations, due to their greater historical responsibility for emissions and their greater capacity to manage the costs of the transition. They assume that non-Annex 1 nations delay peak emissions until 2025, and reduce emissions by 7 percent per year thereafter. They recognize that these assumptions are extremely ambitious but consider that they constitute the most feasible compromise between practicality and fairness. To stay within the remaining carbon budget, Annex 1 nations need to reduce their emissions by 8 to 10 percent a year, starting in 2015. This model was developed using data through 2010; given today's lower carbon budget, Anderson estimates that Annex 1 nations need to reduce emissions by 12 percent a year.[664]

If we accept that Annex 1 nations need to achieve an emissions reduction of 12 percent per year, and if we assume that GDP in Annex 1 nations continues to grow at 1.86 percent per year (the average for the period between years 2010 and 2014), then the decoupling should occur at a rate of 15.8 per cent per year.[665] For perspective, this is eight times faster than the historical rate of decoupling in Annex 1 nations (or 1.9 percent per year from 1970 to 2013), and it is important to note that the rate decoupling generally slowed down during this period.[666] It also exceeds more than five times the pace assumed by the average G20 Nationally Determined Contributions in the Paris Agreement (namely 3 per cent per year).

There is an empirical model that manages to feasibly reduce emissions and is consistent with the Paris Agreement, without relying on negative emission technologies. Published by Grubler *et al.* (2018), it was included in the IPCC Special Report on 1.5°C Rise (2018) in response to growing criticism of reliance on BECCS shown by the IPCC. The scenario, known as “Low Energy Demand” (BDE)[zz], achieves emission reductions compatible with 1.5 ° C by reducing global energy demand by 40 percent by 2050. of decarbonization and afforestation, the key feature of this scenario is that global material production and consumption declines significantly: “Total material production[aaa] declines by 20 percent from today, a third due to dematerialization and two thirds due to improvements in the efficiency of the use of materials.” Dematerialization would be achieved by moving from private ownership of key assets (such as cars) to models based on sharing. The BDE differentiates between the global North and the global South. Industrial activity decreases 42 percent in the North and 12 in the South. With improvements in efficiency, this translates into a drop in industrial energy demand of 57 percent in the North and 23 percent in the South.

The BDE scenario forecasts continued GDP growth of just above 2 percent a year, which would make it consistent with green growth theory. However, the empirical basis for this GDP trend is not strong. It comes from the MESSAGE-Globium model, which calculates GDP from just two inputs: labor supply (population size and productivity) and energy. The low energy demand in the BDE scenario does not affect growth as it is offset by improvements in efficiency. Since the model is insensitive to changes in material production[bbb], reductions in production and consumption do not affect the result. The model does not provide any evidence that GDP will continue to grow despite the reductions. Charlie Wilson, one of the authors of the model, has acknowledged that

“we do not consider broader questions about GDP growth or decline and, for this reason, we do not explicitly report on the relationships between our scenario and the GDP results”.[667]

Conclusions and discussion

Empirical data shows that while absolute decoupling of GDP from emissions is possible and is already occurring in some regions, it is highly unlikely to happen fast enough with respect to carbon budgets for 1.5°C and 2°C in a context of continuous economic growth. Growth increases energy demand, making the transition to renewables more difficult, and increases emissions from land-use change and industrial processes. Models that forecast green growth within the constraints of the Paris Agreement rely heavily on negative emissions technologies that are either unproven or dangerous on a large scale. Without these technologies, the required decarbonization rates to 1.5°C or 2°C are significantly higher than current models suggest is achievable even with aggressive mitigation policies.

This conclusion changes somewhat if we adjust the benchmark growth rate. All of the studies cited above forecast global GDP growth of between 2 and 3 percent a year. A lower growth rate requires a lower decarbonization rate. A 0 percent growth rate requires decarbonization of 6.8 percent per year for 1.5°C and 4 percent per year for 2°C. There is no empirical evidence that 6.8 percent can be achieved on a global scale, but 4 percent is almost achievable. In other words, it is empirically feasible to achieve green growth within a 2°C carbon budget with mitigation policies that are as aggressive as possible *if* the growth rate is very close to zero and *yes* mitigation starts immediately. This conclusion is in line with research by Schroder and Storm (2018), who have found that reducing emissions consistently with the 2°C target is feasible (making optimistic assumptions) only if global economic growth is less than 0.45 percent per year. However, this conclusion does not hold for 1.5°C; emission reductions compatible with 1.5°C are not empirically feasible, except in a degrowth scenario.

Theoretical possibilities

As John O’Neill (2017) says, while it is logically possible to have increasing GDP and decreasing physical and energy production[ccc] in an economy...it is a fallacy to move from statements about what is logically possible to statements about what is physically possible and so is moving from what is physically possible to what is empirically real.

Green growth, as we have shown, is not empirically real, but is it possible *in theory*?

This question is often addressed in terms of the IPAT equation (Environmental Impact = Population x Wealth[ddd] x Technology[eee])[fff], which says that the *impact*

of an economy (p. tons of C per capita) is equal to the *scale* of the economy (GDP per capita) divided by its *efficiency* (eg GDP per ton of carbon).[ggg] Efficiency is determined, in principle, by technology and politics and there is no *a priori* reason why it cannot grow faster than scale, or even as fast as necessary to reduce the impact to a sustainable level. Furthermore, as long as GDP measures what people are willing to pay for things, and not how much energy and resources people consume, there is no reason why the economy cannot theoretically grow using progressively less energy. and resources: people's preferences can shift towards goods and services with increasingly lower energy and material requirements. One can conclude, then, that absolute decoupling should be possible in theory - and, indeed, this is precisely why proponents of green growth are not deterred by objections that it is something that hasn't happened yet and doesn't seem very likely to happen in the future. They attribute it to not trying enough.

The study by Ward *et al.* (2016) provides the most convincing counterargument against this statement. Since there is a thermodynamically defined efficiency maximum, indefinite growth will sooner or later lead to increased resource and energy use. At best, any absolute reduction due to substitution or efficiency will be temporary. Imagine a hypothetical economy powered by solar energy, with a stable supply of food and necessities from renewable sources, in which goods are reused and materials recycled. In the transition to such an economy, resource use will decline. However, even such an economy will still have certain minimum requirements for material inputs, land, etc. so that, once the transition takes place, any further growth of that economy will produce growth in usage

[ccc] *Ditto. N. from t.*

[ddd] "Affluence" in the original. Although the literal translation is "wealth", the equation actually refers to "per capita resource consumption". *N. from t.*

[eee] "Technology" in the original. It actually refers to the "impact produced by the amount of resources consumed". *N. from t.*

[fff] "Environmental Impact = Population * Affluence * Technology" in the original. Hence the name of the equation: IPAT or I=PAT. *N. from t.*

[ggg] "The impact of an economy (eg tons of C per capita) is equal to the scale of the economy (GDP per capita) **times** its efficiency (eg GDP per tons of carbon)" in the original (italics and bold added). Here it seems that the authors have made a mistake, as they literally say "the *impact* of an economy (eg tons of C per capita) is equal to the *scale* of an economy. em> of the economy (GDP per capita) **multiplied by** its *efficiency* (eg GDP per ton of carbon)" that is, Impact=Scale x Efficiency, when efficiency is actually inversely proportional to impact and, therefore, the correct equation would be: Impact= Scale/Efficiency. That is, they should have said " the *impact* of an economy (eg tons of C per capita) is equal to the *scale* of the economy (GDP per capita) **divided by** its *efficiency* (eg GDP per tonne of carbon)", so it has been corrected in the translation. *N. of the t. of resources.* Since compound growth drifts rapidly toward infinity, so will resource usage and impact.

One could respond by saying that we are still far from reaching the limits when it comes to efficiency and substitution. We cannot rule out substitutions or technological leaps that would push such limits so far into the future as to be considered irrelevant (eg nuclear fusion, 100% recycling of materials and powered by fusion or solar energy, etc.). In addition, the economy still has plenty of room for a structural shift towards less resource-intensive services. In other words, it could be argued, green growth may not be sustainable indefinitely, but it can still happen now and can be sustained over a time horizon relevant to our civilization (although it should be noted that Ward *et al.* indicate that the limits of the efficiency of the use of resources could be reached in 2050).

So let's assume that green growth is theoretically possible in the short to medium term. Still, we have to ask if there is a fundamental reason, as opposed to historically contingent reasons, why it hasn't happened yet. Is there any underlying reason why productivity and output[hhh] are so closely coupled[iii] in the empirical record?¹⁷

Notably, the IPAT model gives the impression that A and T, or scale and efficiency, are independent factors, when in fact they affect each other (Ekins 2012). However, note that the IPAT model is a tautology, it is true by the mere definition of the quantities involved[jjj], and should not be confused with a causal model. Furthermore, P, A and T are not independent of each other. For example, we know from basic growth economics that technological development (T) causes economic growth and increased consumption (A). Ecological economists have also shown that the more efficiently an economy uses resources, the more it grows and the more resources it ends up consuming – the so-called Jevons paradox (Polimeni *et al.* 2008). This is not just a matter of rebound effects eating away at small-scale efficiency gains, it is about a more fundamental macromechanism by which industrial economies grow using resources more productively. For example, when technology improves labor productivity, this can be expected to lead to higher growth and more jobs as the relative costs of labor fall - it is not clear why some would expect this to work differently than when it comes to resources (Kallis 2018).

Another fundamental reason why efficiency might be coupled[kkk] with scale is that, as we know from biology and ecology, the metabolism of a large organism, say an elephant, is more efficient than that of a smaller one, let's put a mouse, and this is because the elephant is bigger (Polimeni *et al.* 2008). It is true that relative decoupling of resources or energy often accompanies the growth of an economy, but this could simply

¹⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it*” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

be an artifact of scale. And from there it cannot be inferred that an increasingly [668]¹⁸ relative decoupling will be equivalent to an absolute decoupling. The US economy, like the elephant, couldn't be so big compared to others if it weren't also more efficient, and it's big because it's efficient - but this doesn't mean that getting bigger and bigger will burn less energy. , just as an elephant does not burn fewer calories than a mouse. All of this does not amount to a theoretical refutation of absolute decoupling, but it does show that there might be a more fundamental mechanism linking the scale of an economy to its productivity¹⁹ that is worth exploring.

That said, it might be objected that unlike the scale of an animal, the scale of the economy (i.e. GDP) is a measure of value, not physical size, and can therefore grow without limit, even while resource and power usage performance[mmm] decreases. GDP, one could argue, merely measures what people are willing to pay, which is not necessarily linked to resource and energy use.

Can value grow independently of performance[nnn]? This requires a clear theory of value. Unfortunately, the green growth literature offers no such theory. There are two general possibilities that we could consider. (1) The neoclassical theory of value, according to which value represents utility (how useful goods are to us), which is reflected in prices (how much we are willing to pay for them). In this scheme, GDP is the amount of valuable goods and services that are bought and sold, multiplied by their value. To the extent that the green growth literature considers GDP to be an approximation of total value, we can assume that it accepts this neoclassical theory of value. (2) Work or energy theories of value, which claim that value is ultimately determined by the work or energy that goes into production, implying that there is a more fundamental coupling[ooo] between value and productivity [ppp] (Kallis 2018). From this perspective, value cannot grow without more human labor or energy being devoted to production.

Neither the neoclassical theory of value nor the work or energy theories of value have been empirically tested; in other words, they cannot accurately predict the price at which things are bought and sold. It is impossible to calculate the total work or energy that has been dedicated to the production of a good, nor the utility that it contributes. In fact, no one has ever independently measured utility to see if it has any correlation with prices or willingness to pay (Sagoff 2008). Consequently, we do not have a theory of value that allows us to determine whether value can be absolutely decoupled from production[qqq]. Of course, one could say that there is a third way: we can think of value as the sum of all the "values" that people have. Of course, there is no reason why the things that a society values cannot increase as production[rrr] decreases. However, this approach has two problems. First, if the values are incommensurable, it is impossible to add them up and determine if the total value is growing or not.

¹⁸ "Coupled" in the original. It could also be translated as "linked" or "associated." Since "decoupling" has been translated as "decoupling" throughout the text, it has been decided to translate "coupled" as "coupled". *N. from t.*

¹⁹ "Throughput" in the original. *N. from t.*

Second, one can imagine a society that values the quality of the natural environment above all else; such a value could of course increase as production²⁰ decreases, but to call such a scenario “green growth” is to stretch the meaning of the expression beyond its relevance.

In short, green value growth cannot be shown to be theoretically possible unless we accept a framework that makes it possible by definition - a framework that assumes that value and output[ttt] are determined by some undefined and unlimited so-called utility that is not coupled[uuu] with the physical world. And vice versa, and for the same reason, it cannot be proved that green growth is theoretically impossible either; at least not until the ultimate limits of efficiency and substitution have been reached. As a result, our only reliable guide to the green growth/decoupling question must be empirical. And, as we have shown, existing empirical studies show that green growth is highly unlikely at best. It can be argued that green growth has not occurred because it has not been tried and that the fact that it has not been empirically observed so far would be irrelevant. We, on the other hand, have a more preventive approach and defend that the policy should be made based on solid empirical evidence, instead of based on speculative theoretical possibilities, especially given the seriousness of the crisis we are facing.

Conclusion

This review has concluded that the existing empirical evidence does not support the green growth theory. This is clear from two key records. (1) Green growth requires that we achieve permanent absolute decoupling of resource use from GDP. Empirical predictions do not show any absolute decoupling on a global scale, even under very optimistic conditions. While some models show that absolute decoupling could be achieved in high-income nations under highly optimistic conditions, they also indicate that it is not possible to sustain this trajectory in the long run. (2) Green growth also requires that we achieve a permanent absolute decoupling of carbon emissions from GDP and that we do so at a rate fast enough to prevent us from exceeding the carbon budget by 1.5°C or 2° c. Although absolute decoupling is possible both at the national and global scales (and indeed has already been achieved in some regions), and although it is technically possible to decouple while staying within the carbon budget for 1.5°C or 2°C , empirical forecasts show that this is highly unlikely to be achieved, even under highly optimistic conditions.

Empirical evidence casts doubt on the legitimacy of World Bank and OECD attempts to promote green growth as a way out of the ecological emergency and suggests that any political program based on assuming green growth - such as the Sustainable Development Goals - urgently needs to be re-examined. The fact that green growth

²⁰ *Idem. N. from t.*

remains a theoretical possibility is no reason to design policies around it when the facts point in the opposite direction.

Of course, we need all the technological innovations we can make and we need to direct government policies to achieve these innovations, but this alone is not going to be enough. The evidence presented above indicates that for efficiency gains to be effective, we will also need to reduce economic activity as a whole. We are more likely to be able to achieve the necessary reductions in resource use and emissions without growth than with it. In fact, there is no scientific basis for not questioning growth if our goal is to avoid dangerous climate change and ecological collapse. Staying within planetary boundaries may require decreasing production and consumption in high-consuming nations (Victor 2008, Alier 2009, Jackson 2009, Kallis 2011, Kallis *et al.* 2012) and in the global South the abandonment of the narrow development agenda focused on growth. As Gough (2017) points out, combating climate change could require not only new clean and efficient energy production technologies, but also a reduction and recomposition of consumption, with a shift from intensive carbon emissions to sectors with low or low carbon emissions. Zero carbon emissions. Legislative limits, green taxes, changes in public investments, reductions in working hours or new social security institutions such as basic income all have a role to play in such a transition (Gough 2017, Kallis 2018). The aim might be to find ways to decouple prosperity and development from growth (e.g. Jackson, 2009, O'Neill *et al.* 2018) rather than continue to chase the ghost of green growth .

It seems likely that the insistence on growth is being politically motivated. The assumption is that it is not politically acceptable to question economic growth and that no nation would voluntarily limit growth in the name of the climate or the environment; consequently, green growth must be true, since the alternative is disaster. However, it could well be the case that, as Wackernagel and Rees (1998) point out, “what is politically acceptable is ecologically disastrous while what is ecologically necessary is politically impossible”. As scientists we should not allow political expediency to shape our view of events. We should analyze the data and then draw conclusions, instead of starting with acceptable conclusions and ignoring the uncomfortable facts.

Grades

1. Steffen *et al.* (2015) have identified biosphere integrity and climate change as the basic planetary boundaries worthy of further attention.

2. Wiedmann *et al.* (2015) calculate a similar amount, 70 billion metric tons[vvv] in 2008.

3. This trend was mainly driven by the growth in the use of industrial and construction materials, especially in Asia. It is not clear, however, how much of this material use has been consumed domestically and how much has been exported for consumption in other countries.

4. The UNAP model suggests that decoupling can be achieved at a maximum rate of 1 percent per year. Therefore, GDP growth has to be less than 1 percent per year for the use of resources to be reduced.

[vvv] “70 billions of metric tons” in the original. *N. from t.*

5. Even while CO₂ emissions had stabilized, methane emissions continued to grow by 30 percent between 2002 and 2014 (Turner *et al.* 2016).

6. The trend looks somewhat more promising if we use PPP dollars[www], but PPP estimates are unreliable and tend to overestimate the purchasing power of poor countries.

7. “Climate Scoreboard”, *Climate Interactive*:

[<https://www.climateinteractive.org/programs/scoreboard/>][<https://www.climateinteractive.org/programs/scoreboard/>]

8. Another 9 scenarios include some BECAC, but not to the point of achieving negative emissions.

9. PwC, *Low Carbon Economy Index 2017*.

10. In 2017, 150 GW were installed; The AIER scenario calls for an average of 350 GW to be installed per year until 2050.

This is feasible at current growth rates (between 2016 and 2018 solar and wind capacity grew by 8 percent per year), but the AIER does not specify the necessary trajectory for 2°C. Jacobson and Delucchi (2011) indicate that 700 GW per year need to be added until 2030 -4.6 times the current rate. This requires a growth rate of 25 percent per year from current rates.

11. The global intensity of energy use improved by 1.3 percent per year between 2000 and 2010, and by 1.8 percent per year between 2010 and 2015.

12. Jacobson and Delucchi (2011) state that global energy demand will decrease by 36 percent (according to the BAU scenario for 2050) as fossil fuels are replaced by wind and solar energy, which means that the demand in 2050 it will be less than the demand in 2012.

13. This is the figure that Anderson used in various public talks in 2018. In 2019, he has confirmed to us a range of between 10 and 15 percent per year, through personal correspondence.

14. Using the equation: Rate of decoupling needed = GDP growth rate / (1 - Rate of emissions reductions needed).

15. Decoupling slowed from an average of 2.3 percent per year in the first half of the period to an average of 1.6 percent per year in the second half, according to CO₂ emissions from the World Bank Data Bank (in kg per GDP in 2010 US dollars).

16. Personal correspondence, 2018. It should also be noted that Grubler *et al.* they state that the BDE scenario does not incorporate rebound effects; recognize that this is a major deficiency of the work.

17. For a detailed treatment of this issue, see Ekins (2012).

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ww[w] Purchasing Power Parity Dollars, “PPP dollars” in the original. PPP is a conversion rate that attempts to equate the purchasing power of different currencies by eliminating differences in price levels between countries. *N. from t.*

[<https://www.iea.org/newsroom/news/2016/march/decoupling-of-global-emissions-and-economic-growth-confirmed.html>][<https://www.iea.org/newsroom/news/2016/march/decoupling-of-global-emissions-and->][<https://www.iea.org/newsroom/news/2016/march/decoupling-of-global-emissions-and-economic-growth-confirmed.html>][[economic-growth-confirmed.html](https://www.iea.org/newsroom/news/2016/march/decoupling-of-global-emissions-and-economic-growth-confirmed.html)]

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Presentation of “DARWIN AMONG THE MACHINES”

The text that we present below is not a fictional text, but a real and serious letter sent to a New Zealand newspaper in 1863. It was written by Samuel Butler, alias Cellarius, a 19th century British writer. It is surprising that in those remarkably technologically optimistic times, when many of the negative effects that industrial technology would later have on Nature and on human behavior were not yet known, and when rapid technological advance was often naively seen as holding great promise considering only the advantages that it seemed to be bringing to humanity, someone already glimpsed some of the problems that technological progress was beginning to generate. But even more surprising is that now, 150 years later, with everything that has happened and everything that is already known about it, most human beings still do not see any intrinsic problem in modern technology.

Of course, the author, like the vast majority of intellectuals then (and now), was actually a firm believer in the idea that evolution implies progress, improvement, “elevation” and that the human being is the culmination of said process, the end and purpose to which evolution was directed. This leads him to make certain statements that today, anyone who is minimally informed about these matters or simply has a minimum of enlightenment, may find it shocking and strange, such as considering that some living beings are “more evolved” than others and, therefore, that the former are superior to the latter; or ensure that domestication always implies an improvement in the quality of life of the beings subjected to it.

However, despite these punctual blunders, the author hit the nail on the head when pointing out the serious real threat posed by the probable replacement of human beings by machines and proposing the solution: declare war to the death and destroy them by doing regress society to a very low level of technological development.

DARWIN AMONG THE MACHINES¹[To the editor of *Press*, Christchurch, New Zealand, June 13, 1863].

Dear Sir:

There are few things of which the present generation can be more justly proud than the wonderful improvements that are happening daily in all kinds of mechanical

¹ Translation by Último Reducto of the letter “Darwin Among Machines” by Samuel Butler (alias Cellarius) addressed to the New Zealand newspaper *Press* (*Press*, 1863 , pages 180-185). *Translator’s note*.

applications. And, in fact, this is something to be extremely congratulated on in many respects. It is not necessary to mention them here, because they are obvious enough. What prompts us to write this letter are certain considerations which might tend in some way to temper our pride and make us think seriously about the future prospects of the human race. If we go back to the earliest and most primordial types of mechanical life, to the lever, the wedge, the inclined plane, the screw and the pulley, or (for the analogy would take us a step further) to that primordial type from the which the entire mechanical kingdom has developed, we mean the lever itself, and if we then examine the machinery of the *Great Eastern*² we will be almost astonished at the vast development of the mechanical world, at the gigantic steps with which it has advanced in comparison with the slow progress of the animal and vegetable kingdom. It will be impossible for us not to wonder what will be the end of this powerful movement. In which direction is it trending? What will be your result? Indicating where the answers to these questions can be directed is the object of this letter.

We have used the expressions "mechanical life", "the mechanical kingdom", "the mechanical world" and the like, and we have done so deliberately, since like the vegetable kingdom it developed slowly from the mineral and, from a similarly, the animal superseded the vegetable, so now, in these latter times, an entirely new kingdom has arisen, of which we have so far seen only what will one day be considered the antediluvian prototypes of its race.

We deeply regret that our knowledge of both natural history and mechanics is too small to enable us to carry out the gigantic task of classifying machines into genera and subgenera, species, varieties and subvarieties, etc.; to trace the links connecting machines of widely different characters together; to point out how man's subordination to their use has played among machines the role that natural selection has played in the animal and plant kingdoms; to mark the rudimentary organs still existing in a few machines, feebly developed and utterly useless, though they serve to indicate that they are descended from some ancestral type which has either perished or been transformed into a new phase of mechanical existence. We can only present this field of research; it must be studied by others whose education and talents are of a higher order than we have attained.

We have decided to venture a few clues, although we do so with the deepest insecurity. First of all, we would emphasize that just as the lowest vertebrates managed to reach a very large size that has been decreasing in living vertebrates that present a higher degree of organization, so a decrease in the size of machines has often accompanied their growth. development and progress. Take for example the pocket watch. Examine the beautiful structure of this small animal, observe the intelligent game of tiny members that compose it; however, this little creature is nothing more than a development of the bulky grandfather clocks of the thirteenth century - not a degeneration of them. The day will come when grandfather clocks, which are certainly not

² The *Great Eastern* was an English steam and sail-powered ocean liner built in 1858. *N. from t.*

shrinking in size today, may be completely superseded by the universal use of pocket watches. In such a case grandfather clocks will die out like the first lizards, while the pocket watch (whose tendency for years has been more in the direction of diminishing in size than vice versa) will be the only type left of an extinct race.

So the ways of looking at the machinery that we are faintly indicating will suggest the solution to one of the biggest and most mysterious questions of today. We refer to the question: What type of creature is most likely to be the successor of man in supremacy on earth? We have often heard debate about this; but it seems to us that we ourselves are creating our own successors; day by day we are making your physical organization more and more beautiful and delicate; every day we are giving them more power, and we give them that self-regulating and self-acting power, which will be for them what the intellect has been for the human race, through all kinds of gadgets. With the passage of time we will realize that we will have become the inferior race. Inferior in power, inferior in that moral quality which is self-control, we will look up to them and see them as the pinnacle of all that the best and wisest of men can ever dare to aspire to. No bad passion, no jealousy, no greed, no impure desires will disturb the serene power of these glorious creatures. Sin, shame, and sorrow would have no place among them. Their minds will be in a state of perpetual calm, the satisfaction of a spirit that does not know desires, that is not disturbed by regrets. Ambition will never torture them. Ingratitude will not make you feel uncomfortable for a moment. The consciousness of guilt, the hope postponed, the pain of exile, the insolence of those who hold office and the contempt that undeserved merit entails - will all be unknown to them. If they require "food" (through the use of this very word we are betraying our recognition that they are living organisms) they will be attended by patient slaves whose work and interest, in exchange for nothing, will be to see what they want. If they stop working they will be promptly attended to by physicians who are thoroughly familiar with their constitution; if they die, because even these glorious animals will not be exempt from that necessary and universal consummation, they will immediately enter a new phase of existence, because what machine dies totally in all its parts at the same time and in the same instant?

We take it for granted that, when the state of affairs which we have tried to describe in the preceding paragraph arrives, man will have become to the machine what the horse and dog are now to man. It will continue to exist, better said even better, since it will probably be better off in this state of domestication under the benevolent rule of the machines than in the wild state in which it now finds itself. We treat our horses, dogs, cats, cows and sheep, in general, with great kindness; we give them all that experience has taught us is best for them, and there is no doubt that our consumption of meat has increased the happiness of the lower animals much more than it has reduced it; similarly it is reasonable to suppose that machines will treat us kindly, since their existence is as dependent on us as ours is on the lower animals. They will not be able to kill us and eat us as we do with the sheep; They will not only need our services to give birth to their descendants (this branch of their economy will always remain in

our hands), but they will also need us to feed them, to fix them when they get sick and to bury their dead or to that we transform their corpses into new machines. It is obvious that if all the animals of Great Britain except man were to perish, and if at the same time all intercourse with foreign countries were made utterly impossible by some kind of sudden catastrophe, it is obvious that under such circumstances the loss of human life would be appalling. -In the same way, if humanity ceased to exist, the machines would be in just as bad a situation or even worse. The fact is that our interests are inseparable from theirs, and theirs from ours. Each race is dependent on the other for innumerable benefits, and until the reproductive organs of the machines have developed in a way that we are still barely able to conceive, they will remain completely dependent on man if only for the continuation of their kind. . It is true that these organs may eventually develop, since man's interest lies in that direction; There is nothing that our capricious race desires more than to see a fertile union between two steam engines; it is true that machinery is already being used these days to breed more machinery, to make machines progenitors of machines which are often of their own kind, but the days of flirtation, courtship and marriage between them they still seem very remote and in fact can hardly be conceived by our weak and imperfect imagination.

Every day, however, the machines are gaining ground on us; every day we are becoming more subservient to them; every day more men are subjected as slaves to them; more and more men are devoting the energies of their whole lives to the development of mechanical life. Time will tell what the outcome of all this will be, but no person with a truly philosophical mind can doubt for a moment that there will come a day when machines will exercise real supremacy over the world and its inhabitants.

Our opinion is that war to the death against them should be proclaimed immediately. Every machine of any kind should be destroyed by those men who love their own kind. Let no exceptions be made, let them be given no quarter; let us return once and for all to the primitive state of the race. If it is objected that this is impossible under the present conditions of mankind, this itself proves that the damage has already been done, that our servitude has truly begun, that we have brought up a race of beings beyond our power to destroy. , and that we are not only enslaved but that we are absolutely content with our ties.

We will leave this topic for now, which we present free to members of the Philosophical Society. If you give your consent to make use of the vast field of study that we have indicated, we will try to work on it in the future for an indefinite period.

Sincerely,
Cellarius

Presentation of "The myth of the environmental movement"

The following text by Dave Foreman is focused on the popularization of environmentalism as a movement or social current in the United States. However, saving the distances between countries and cultures, many of the things that the author points out and criticizes are also valid for the environmentalism of any other country. In particular, we believe that the differentiation established by the author between environmentalism and conservationism is very accurate and points out certain features of environmentalism that should be taken into account by all those who really value the wild and wish to preserve it. Environmentalism, the main current within the so-called "environmental movement" today, has made the concepts of "environment" and "Nature" are understood as synonymous by the majority of the population today, although in reality they are not. not at all the same. And it has also ensured that the label "environmentalism" is widely, and often disdainfully, understood today as a mere branch of leftism, as a current fundamentally concerned with things like social justice (or even animal rights) or to sustain and improve the man-made environment and not so much (or not at all) to preserve the wilderness of the natural world. This text gives reason to think about the convenience of currently identifying with environmentalism in general, even in the case of having the autonomy of Nature as a fundamental value. Or maybe precisely because of it.

The myth of the environmental movement[a,b]

By Dave Foreman

In the years after Earth Day, environmentalism, once considered the selfish luxury of a privileged elite, became "America's cause."[c]

Phil Shabecoff, *A Fierce Green Fire: The American Environmental Movement*

The Myth in a nutshell

Earth Day, April 22, 1970, gave birth to the long-gestating reconversion of the American conservation movement into the environmental movement.

Adapted from chapter 1 of *Take Back Conservation*, by Dave Foreman. (Raven's Eye Press, 2012). Copyright ©2012 Dave Foreman

[b] Translation of "The Myth of the Environmental Movement" by Dave Foreman, "Around the Campfire" no. 40 (July 22, 2012). Original available *online* at *Rewilding Earth*:[\[https://rewilding.org/wp-content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf\]](https://rewilding.org/wp-content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf)[\[https://rewilding.org/wp-\]](https://rewilding.org/wp-content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf)[\[https://rewilding.org/wp-content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf\]](https://rewilding.org/wp-content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf)[\[content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf\]](https://rewilding.org/wp-content/uploads/2012/07/40-The-Myth-of-the-Environmental-Movement.pdf).
from t.

[c] "In the years following Earth Day, environmentalism, once regarded as the de self-serving indulgence of a privileged elite, became 'America's cause.' ..." in the original.
N. from t.

[d] "Environmental movement" in the original. The term "environmental" literally means "environmental" or "environmental" and, therefore, its derivative "environmentalism" would literally translate as "environmentalism". However, given that "environmentalism" is usually translated as "environmentalism" and that some, like Foreman and this translator, correctly differentiate between environmentalism (that is, those struggles in favor of a more habitable and socially just artificial environment) and conservationism (that is, those struggles in defense of Nature) in particular and environmentalism in general (that is, the implausible hodgepodge supposedly constituted by the conservation movement was tired, stagnant, and out of touch with a growing and changing United States. With the publication of *Silent Spring*^[e] by Rachel Carson, which appeared in 1962, the public became more aware of and concerned about the evil poisons that were fouling their air, their water, their soil, and their bodies. the Santa Barbara oil spill in 1969^[f], the thickening smog in stifling cities, and the Cuyahoga River bursting into flames as it passed through Cleveland on June 22, 1969^[g], the attacks on our living space were obvious.^[524]¹^[526] The elitist conservation movement, which had never found favor with Americans, made it "relevant" overnight by adopting the new goal of tackling the threats that primarily hurt *people* - smog, poisons in our food, polluted rivers, traffic jams, the dangerous Pintos and the thoughtless, insensitive and even evil big business. Until then, conservationists had been a bunch of hikers, mountaineers, and sport hunters. However, the environmentalists were mothers, fathers and children. Deep forests with tall trees stretching for miles, wildlife, and National Parks were fine, but at the end of the day, human health, safety, and quality of life came first. Today, the environmental movement has been casting its nets further and further, beyond combating pollution and protecting nature^[527], to encompass social justice, anti-colonialism, feminism, the rights of animals and green policies

¹ "Wildlife" in the original. The term "wildlife" usually refers above all to wild fauna, but since Foreman usually refers to the protection of wild beings or entities in general ("wild things") in his texts, in this text it has been translated as "wildlife" to also include other beings

And that is how the Myth of the Environmental Movement was created. It is promoted in various ways by academics and the news, and is believed by the public, politicians, and many of those who belong to both conservation and environmental organizations.

However, it is false.

John Muir used to sit next to any flower that was new to him and try to study it to get to know it. Let's sit down, making a stop on our way, here, next to the Myth of the Ecologist Movement, to be able to observe it petal by petal, root by root and thus try to know what it is like. We can divide this myth into four sets of beliefs:

(1) First and foremost, the Green Movement Myth, asserts that in general *both* those who care about pollution *and* those who care about Endangered Species², *both* those who care about urban transport *and* those who care about wilderness, *both* those who care about human health *like* those who care about "ecology" constitute only one type of people.

(2) Earth Day 1970 is touted as the date conservation broadened into the lively, friendly, and powerful environmental movement. Veteran *New York Times* environmental reporter Phil Shabecoff wrote, "*In the years following Earth Day, environmentalism, once considered the selfish luxury of a privileged elite, became in the "USA cause".*"³

(3) The Myth claims that, before Earth Day, conservation was in decline, unknown to most Americans, and politically weak. In 1971, even the wide-awake, clairvoyant, and perceptive human ecology expert Paul Shepard wrote, "In 1970 the long but little-known crusade for conservation, once dominated by 'nature lovers' and modestly devoted to a mix of recreational activities and land use improvements, suddenly became part of national concerns."⁴

(4) Environmentalism is primarily about human health. Back in 1994, the founder of the National Association of Physicians for the Environment (ANMM)[k], Dr. John Grupenhoff, said, "Every environmental problem is or will end up being a health problem. Therefore, prevention of contamination is prevention of disease."⁵ (I don't know what happened to the ANMM, but something similar is sorely needed today).

Allow me to break down each of these beliefs, with our scalpel, our tweezers and our magnifying glass and so that we can then take a closer look at their ridiculous myth made of basted scraps; so that we can see that environmentalism and conservation are not the same.

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ "Wilderness Act" in the original. *N. from t.*

First of all, I don't think there is an "Environmental Movement". Rather, what I see is work to maintain wild lands and wildlife as *the movement* or *network for conservation* and work to stop the damage that technology causes to human health and quality of life as the *environmental movement*, which would be better called *network for human health*. My friend David Quammen, author of *The Song of the Dodo*[m] and perhaps the best writer on biodiversity around, thinks a lot like me. In an interview he gave in 1999, he said, "The preservation of biological diversity and the cleanup of the environment are not a single undertaking. ... conservation and environmentalism are not the same"[529]. In his *Outside* magazine column, "Natural Acts," he had written a few years earlier, "The expression 'environment' means the whole of what surrounds some central and preeminent thing. This central thing... is human life. Thus, the very expression 'environment' carries with it the assumption that humanity is the protagonist of a single character drama around which everything else is merely stage and proscenium". And he went on to say, "Environmentalism is not essentially evil. It's just an understandable campaign for self-interest on the part of our species, with potentially dire implications for the world at large. What seems perverse is to confuse environmentalism with conservation."[530] I would like that

[k] "National Association of Physicians for the Environment (NAPE)", in the original. *N. from t.*

l "Wildlands and wildlife" in the original. *N. from t.*

[m] *The Song of the Dodo: Island Biogeography in an Age of Extinctions*, Scribner, 1996. *N. of t.* more of my conservationist friends take these words into account and refine their language. To tarnish conservation with the name of "environmentalism" is not only wrong, it is detrimental when it comes to protecting wildlife.

The late Canadian naturalist John Livingston wrote thirty years ago in his relentless book, *The Fallacy of Wildlife Conservation*, that "'environmentalism' ... should not be confused with wildlife preservation" .⁶ Many other conservationists agree when they hear that conservation and environmentalism are not the same thing (although far fewer environmentalists do the same thing). So, I'll call *conservation* protecting wildlands and wildlife, *environmentalism* fighting pollution, and "Green Movement" (in quotes and capitalized to show that is something fictitious) to the networks that join both tendencies. Today, for most people, conservation and environmentalism are the same thing (this is one of the reasons I'm writing this book, after all). I myself have been involved in several heated arguments over this belief - most often with a handful of environmentalists and academics. Thoughtful conservationists, with a stronger, deeper, and more direct understanding (from *inside* of the conservation movement itself), are far more likely to see the two movements separately. Some of these worry, however,

⁶ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

that drawing too many differences is harmful. In these bad times, they feel that we lovers of the wild need all the friends we can get. Seeing both movements as different, however, does not imply that they cannot work together.

Second, that bit about conservation being a “luxury” that has little to offer is complete bullshit, as I have already shown in my books, *The Big Outside*[n], *Confessions of An Eco-Warrior*[0] and *Rewilding North America*[p]. In fact, over the last hundred and fifty years, they have been the conservationists who have brought to America most of the best of everything our country is built on. Conservationists had already racked up many victories and made a lot of headway before 1970.

Starting in the early 1950s, they stopped a dam project in Dinosaur National Monument, got nearly 10 million acres of arctic wilderness protected in Northeast Alaska, got Congress be approved and that President Johnson sign the Wild Spaces Act and the National System for the Preservation of Wild Areas and that a National System of Scenic and Wild Rivers begin to be constituted, thus ensuring that some water currents could continue to flow freely, no prey. Each of these victories was big, BIG. I don’t think we could get the Wilderness Law passed today. In the late 1960s, major battles to declare new National Parks were won in the redwood forests of Northern California and the northern Cascades [531][s * *] of Washington, as well as to stop the construction of dams in the Grand Canyon. These fights made headlines all over the United States. Even with the hot topics of Vietnam and civil rights occupying the newspapers and televisions, the redwoods and the Grand Canyon made the news.

A fact widely overlooked by those who sneer at the “irrelevance” of “elitist” is that members of Congress in their chambers (and to their *voters*), between 1965 and 1971, conservationists of the pre-Earth Day era were called the “wildcats” of the Wilderness Protection Acts. These laws dedicated to declaring Wilderness Protected Areas promoted by the wildcats, were prepared and promoted by men -and women- nature lovers who knew the land and against whom the Forest Service (from the rangers in the field to their boss in Washington) came to grips. The political weight of the wildcats was enormous as it led directly to the creation of the roadless zone inventories and eventually the 2001x Roadless Zone Regulations, which, in one fell swoop, did more for keep America’s wilderness wild than any other single action taken in the 48 contiguous states.[532] All of these struggles captured the attention and support of many people throughout the national territory.[533]

It is equally true that Earth Day, along with the wave of outrage over pollution, led to landmark legislation in the early 1970s concerning air quality, water quality, and the like. I would love to see this social uproar again - this time against greenhouse gas pollution. So I’m not disparaging the discontent in the ’60s about how big business was poisoning us; here I just want to show that the fight for the protection of public lands was already working itself out long before, and continued to do so long after, Earth Day 1970.

Also, the conservation people weren’t very interested in celebrating Earth Day. Dr. Edgar Wayburn, vice president of the Sierra Club[and] at the time, and even then

an intelligent and tireless warrior for nature, warned, “We cannot give up the old-fashioned battle for wilderness⁷,” in response to the call to jump on the anti-pollution bandwagon.[534]

Third, the conservation movement leading up to Earth Day had brought together a large number of Americans. Post-Earth Day conservation continued to attract even more people—not just those who were concerned about pollution or those who were encouraged to do something by Earth Day, but many of those who were part of the growing throngs of hikers, bird watchers, whitewater river rafters and fly fishermen fighting to save their favorite spots from destruction, as well as those who decided to act after learning of widespread extinction of wildlife and the large-scale decimation of ecosystems. In the 1960s, the campaign in favor of the Wilderness Law and in favor of declaring new Wilderness Areas Protected[aa] by it gave rise to a growing grassroots network of grassroots groups, which continued to grow through the 1970s and 80. The belief that people involved in conservation before Earth Day were elitist is superficial and exaggerated. It is maintained and disseminated by those who weren’t there, by those who haven’t talked to those who were, and by those who haven’t read *The Living Wilderness*, the *Sierra Club Bulletin* and the rest of the writings on conservation of that time. The people I have known who were already working in favor of Protected Wilderness Areasbb before I arrived in 1971 were mostly middle-class people; among them were counted those who could be considered “blue blooded”. The only sense in which they could be considered elite is in regards to their knowledge of nature, their kindness, their wisdom, and their open-mindedness, which are certainly the kind of elitism that really matters, the kind of elitism that really matters. of elitism - or *natural aristocracy* - that Thomas Jefferson hoped would emerge in the new American Republic as it grew.

Fourth, I happen to agree with Dr. Drupenhoff. Environmentalism *is about* human health. Environmentalists should be the ones most willing to admit it. It is *not* conservation. It’s not about wilderness. However, you don’t necessarily have to be against protecting wild animals” and letting evolution take its course. *Environmentalism is a great friend of conservation, just as conservation is of environmentalism.*

I am analyzing the Myth of the Green Movement by referring to a few of its aspects. Basically, as I just showed, you are wrong. It is a sock drawer, full of socks, bras, underwear, gloves, light bulbs, screwdrivers... It is a map that does not represent the territory - if you take it as a guide, you will get lost. Using the expression “Green Movement” to name both those who work to protect wild nature and preserve endangered wildlife as a whole, and those who work to clean up pollution and make our cities habitable, is not a good way of representing to these people and groups.

Putting two movements that are completely different into one only causes quarrels and fights, like in a bad marriage. Thus, we can hear some environmentalists disparag-

⁷ Original title: *The Vanishing face of Gaia*.

ing the work on Wilderness Protected Areas and Endangered Species as petty and ridiculous, or even worse.

[aa] “Wilderness Areas” in the original. When Foreman capitalizes “Wilderness Areas” he is referring to protected wilderness areas. See, for example, note 2 of “Where Man Is a Visitor”, in *Place of the Wild*, David Clark Burks (ed.), Island Press, 1994. [There is a Spanish translation: “There where man is a visitor”, in *Indomitable Nature*: [\[http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante\]](http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante)[\[http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/all-where-the-man-is-man-is-a-visitor\]](http://www.naturalezaindomita.com/textos/wild-nature-and-ecocentric-theory/all-where-the-man-is-man-is-a-visitor) [a-visitor] *N. from t.*

[bb] Ditto. *N. from t*

[cc] “Woodcraft” in the original. *N. from t*

[dd] “Wildeors” in the original. “Wildeor”, literally “wild beast” (“wilde-deor”), is an Old English word of Germanic origin that Foreman likes to use to refer to wildlife and which, according to him, is the etymological root of “wilderness”. (“wilde-deor-ness”, “place where wild beasts dwell”). See, for example, the interview with Jeremy Lloyd, “Redneck for Wilderness: Earth First! co-founder Dave Foreman on being a true conservative”, published in *The Sun*, December 15, 2005. *N. of the t.*

[ee] “Wilderness Areas” in the original. *N. from t.*

Some consultants, pollsters and sponsors, who come from environmental or community backgrounds rather than nature-related backgrounds, are advising brave and hard-working conservation organizations to stick out their tongues, sit down and talk and try to make deals with the other “stakeholders”. They tell us to talk about people, not wildlife, and to hide our love for wildlife for their own good.

If we think that there is only one “Ecological Movement”, without fissures, those of us who love wild nature and wildlife will have a hard time detecting and recognizing those tendencies within the “Ecological Movement” that underestimate and prevent protection and reconstruction of the wild beings.

And finally, “environmentalism” has a dubious, if not downright bad, reputation among some of those who might seriously support land and wildlife conservation. Among these folks are some hunters and fishermen, small townspeople who like birds and trees, and thoughtful Republicansff or independents who still believe in prudence and responsibility.

So as long as conservation continues to be conflated and conflated with environmentalism, I’m afraid it’s going to be more and more difficult to bring out the real history of conservation and prevent wilderness and wildlife from being neglected.

Grades:

1. In the period between the late 19th century and the 1950s, it was not uncommon for rivers in industrial areas to burst into flames. Yet the hitherto unheard-of hype

surrounding the Cuyahoga in 1969 was a milestone in the great shift in American mindset. Christopher Maag, “From the Ashes of ’69, a River Reborn,” *The New York Times*, June 21, 2009.

2. “Endangered”[gg] and “Threatened”[hh] are legal designations, under the Endangered Species Act[ii], for those creatures that are close to extinction. So when I write them referring to this legal meaning, I capitalize them.

3. Shabecoff, *A Fierce Green Fire* (Island Press, 1993), 114.

4. Paul Shepard, “Preface One,” in Paul Shepard and Daniel McKinle (eds.), *Environ/Mental: Essays On The Planet As A Home* (Houghton Mifflin Company, Boston, 1971), vii . Shepard became disgruntled with conservation organizations in the late 1950s because he felt they didn’t do enough to combat commercial logging in Olympic National Park. He also [535]⁸ believed that conservation was being too superficial about what it was fighting, that we needed a much deeper insight into the ills associated with modernity.

5. Michael Castleman, “Dr. Clean”, *Sierra*, January/February 1994, 22.

6. “An Interview with David Quammen,” *Wild Duck Review*, Winter 1999.

7. David Quammen, “Dirty World, Clean Place”, *Outside*, August 1991, 25-26.

8. John Livingston, *The Fallacy of Wildlife Conservation* (McClelland and Steward Limited, Toronto, 1981), 19.

9. I’ll be dealing with the wildcats of wilderness protection laws in one of my next books, *Conservation vs. Conservation*.

10. The film about David Brower, *Monumental: David Brower’s Fight for Wild America*, shows how the struggles for public lands in the 1950s and 1960s were widely known, as were Roger Kaye’s book, *Last Great Wilderness: The Campaign To Establish the Arctic National Wildlife Refuge* (University of Alaska Press, Fairbanks, 2006) does.

11. Mark Dowie, *Losing Ground: American Environmentalism at the Close of the Twentieth Century* (The MIT Press, Cambridge, Ma, 1995), 25

⁸ “Endangered Species Act” in the original. *N. from t.*

THE LIMITS OF SPIRITUAL ENLIGHTENMENT

biosocial discontinuity theory and the great spiritual traditions (with some comments on Ken Wilber)¹

By Tomislav Markus

THE ROOTS OF SPIRITUAL TRADITIONS

For a long time, in popular culture and in many academic works, the term "civilization" had a noble and sublime meaning. Civilization meant being above the wild, chaotic outside natural world and/or the aggressive inner human nature. To be "civilized" meant to be moral, noble, and rational. The idealization of civilization seems to be something normal, since there were no opposite terms such as "noble savage" (in popular or scientific literature there was no "good citizen" or something similar). But during the 20th century other opinions began to emerge. Initial views on the repressive character of the civilized state - like those of Sigmund Freud - still held a progressive perspective² albeit somewhat ambivalent. The civilization may have been repressive, but it was still "progressive" and "noble." In the academic literature there were some more positive evaluations of the "primitive" - mainly of simple horticultural societies or, less frequently, hunter-gatherers, but they were branded as "fallacies of the good savage".

Anthropic problems - collective pathologies such as war, most diseases, interpersonal exploitation, state repression, pollution, ecological destruction, urban loneliness, violence, anomie, etc. - are a fundamental characteristic of all complex societies. In the last 40 years or so, many scientists and academics - anthropologists, archaeologists, historians, sociologists of history, biologists, etc. - have pointed out that recent human history, the last 10,000 years, from Neolithic domestication onwards, is not progressive

¹ Translation by BR of "Limits of Spiritual Enlightenment. The Theory of Bio-Social Discontinuity and Great Spiritual Traditions (with some Remarks about Ken Wilber)", originally published at [<http://www.integralworld.net>][www.integralworld.net], (February, 2009):[<http://www.integralworld.net/markus1.html>][<http://www.integralworld.net/markus1.html>.] *Translator's note.*

² "Progressive" in the original. This English term can be translated either as "progressive" or as "progressive". It has been considered that "progressive" is the most appropriate translation in this text. *N. from t.*

but regressive, not in a moral sense, but in a sense related to the continuous decline of the quality of human life and the continuous increase of anthropic problems. The deepest causes of the great anthropic problems and human misery do not lie in capitalism or industrial society but in the beginnings of domestication and civilization (Diamond 1974, Fox 1989, Harris 1991, Maryanski-Turner 1992, Livingston 1994). , Schmookler 1995, Shepard 1998a, 1998b, Sanderson 1999, Brody 2002, Horton 2000, Hughes 2001, Fagan 2004, Christian 2005, Ferguson 2006, Fry 2007, Rowe 2006, Ponting 2007, etc.). Of course, there are many inconsistencies and ambiguities in the works of these theorists - some of them think, for example, that industrial societies achieve a certain kind of progress compared to agrarian civilizations, some focus on certain problems like war and ignore others - but the classic linear progressivism and the idealization of civilization as "rise and progress" have been definitively abandoned.

Darwinism, or evolutionary biology, provided a scientific basis for that abandonment. The recent appearance of complex human societies was a well-known fact in the nineteenth century. But the slow acceptance of neo-Darwinism in the social sciences after 1960, based on the so-called "modern synthesis"³ of the 1930s and 1940s, made possible an explanation of the deeper causes of anthropic problems. The fundamental characteristic of Darwinian evolution is the non-directed, genetic adaptation of life forms and species to certain specific local environments. Darwinian evolution is random, without purpose, without "more/less" evolved forms, without progressive direction, without goal-directed processes, simply opportunistic adaptation to local ecological conditions. This means that all species have some natural environment or, in the language of contemporary evolutionary psychology, an environment of evolutionary adaptation. For humans, that environment is ecologically clean and wild and socially small nomadic groups (20-30 members).

In the last 40 years or so, many thinkers have pointed out that human beings are genetically adapted to such conditions, in which our ancestors lived for hundreds of millions of years (ecological environment) or tens of millions of years (social environment).

A life, normally called a hunter-gatherer society, that genetically we never leave. Social changes were too rapid for adequate genetic adaptation (Barash 1986, Fox 1989, Maryanski and Turner 1992, Boyden 1992, 2004, Schmookler 1995, Shepard 1998a, 1998b, 1999, Morris 2004, Wilson 2003, 2004). In the last 30 they have defended that same position. Of course, in the last 10,000 years more and more human beings have been living under totally different social and ecological conditions: agriculture, nomadic herding, state, cities... and this is precisely a fundamental cause of human problems.

³ The theory, developed by Theodosius Dobzhansky, George Gaylord Simpson, Ernst Mayr, Julian Huxley and others, which integrates: the theory of evolution of the species by natural selection of Charles Darwin, the genetic theory of Gregor Mendel as the basis of biological inheritance, random genetic mutation as a source of variation and mathematical population genetics. *N. from t.*

Neolithic domestication signifies the beginning of an ever-widening schism between human nature (meaning adaptation to hunter-gatherer life) and an unnatural⁴/abnormal social environment. The abandonment of social and ecological conditions in the last 10,000 years was the main cause of the ever-increasing anthropic problems. Civilization is not a hard-won success but a kind of abnormal society that generates many of the hallmarks of pathological behavior, especially in industrial megacities. I called this approach “biosocial discontinuity theory” and have recently written two books in Croatian about it (Markus 2006, 2008).

Biosocial discontinuity theory is not a wild man’s fallacy. It has nothing to do with morality (goodness), but only with genetic adaptation. An environment of evolutionary adaptation is by no means an earthly paradise - in the hunter-gatherer life there are many problems and misfortunes (certain diseases, predator attacks, infanticide, some violence...) - but it is an optimal environment. “Optimal”, that is, relatively the best environment for the satisfaction of basic human needs: community, belonging to a place, clean and wild environment, social and ecological stability, equality, peace, etc. In the hunter-gatherer society there may be murder, but not war; certain distinctions based on sex and age, but not social stratification; personal prestige, but not state power; environmental modification (perhaps even extinction of several species due to hunting), but not massive destruction and pollution of the environment; etc. These aspects of human behavior are part of some basic evolutionary parameters and can be easily understood.

In general, biosocial discontinuity theory was criticized in favor of cultural adaptation, that is, faith in the plasticity of human behavior and in the power of culture. The latter was assumed as the standard model of the social sciences and criticized in depth in the new Darwinian literature, especially from sociobiology and evolutionary psychology (Wilson 2003, Barkow 2006, Buss 2007, Markus 2008). If man is a *blank slate*⁵ and culture is something so powerful, why are there so many anthropic problems and so many collective pathologies in all civilizations? They are symptoms of very poor adaptation on the part of humans. Thanks to culture, humans can create and survive in abnormal conditions, even as slaves in mines, but they cannot prosper, that is, they cannot satisfy their basic needs. If the life of slaves and serfs in agrarian civilizations is not good -because we are not genetically adapted to it-, how can the life of workers or employees in an industrial city be good? That life also has no basis in our evolutionary past.

The irresistible lure of mindless and destructive consumption in modern society can be explained as compensation. Humans cannot satisfy their basic needs -as they live in

⁴ “Unnatural” in the original. The English term “unnatural” can be translated either merely as “unnatural” or “non-natural” or else as “unnatural” or “contrary to nature”. The second meaning is usually the most frequent. In this text it has also been translated in the latter way. *N. from t.*

⁵ Literally, “clean slate” in Latin. The idea of the *tabula rasa* defends that individuals are born with an “empty” mind, that is, without innate qualities, so that all their knowledge and skills are exclusively the result of learning through their experiences vital. *N. from t.*

an unnatural society- and they seek material objects and technological wonders. The high standard of living becomes a compensation for the low quality of life. But human nature cannot be fooled for a long time and humans seek, again and again, peace, community, clean and wild environment, etc. Human beings, like everyone else, have their own environment of evolutionary adaptation, that is, they are genetically adapted to specific social and ecological conditions. This is the most important argument about the biological continuity between the human being and the rest of the species, and not culture, language, reason, etc. The other species -or some of them- may have culture (transmission of information by non-genetic means), language (different forms of communication), conscience, reason and other capacities, but we should not emphasize it, since it would be to go back to the traditional perspective establishing the existence of “higher” and “lower” life forms (those other species would be comparable to “primitive” humans or would have some [human] capabilities but to a “lower” degree). This is a subjective approach, choosing the criteria that best suits us in order to win. But it is not a scientific approach.

what about the “great spiritual traditions” and the “perennial philosophy”⁶? The thinkers - philosophers and theologians - of the agrarian civilizations did not know, nor could they know anything, about the theory of biosocial discontinuity or about the antiquity of the evolutionary time in which the human mind was formed. They knew nothing about the million years we lived as hunter-gatherers (the so-called “barbarians” were mainly nomadic herders or simple horticulturists). These thinkers believed that human history and the history of civilization were the same. So they thought that the main cause of human misery and the countless anthropic problems in their societies was some kind of moral failure in the human mind: original sin in Christianity, a bad inheritance from previous lives in philosophies and religions. Hindus, or something like that. The “solution” would go through some kind of spiritual “enlightenment”⁷ or elevation of man “above” chaotic and repressive social conditions. This could imply a more elitist “solution” destined for a handful of thinkers, as is the case with many philosophies, or it could have more democratic features, as in the Axial religions.

Originally, these religions were a reaction against the anthropic problems and human misery existing in agrarian civilizations and offered comfort to the miserable masses, faith in the afterlife (Christianity, Islam) or an absolute escape from life (religions of the India). On the other hand, they quickly became linked to the powerful political structures of their societies and became an ideological defense of the existing political and social conditions. The defenders of the “great spiritual traditions” were philosophers and theologians with a humanist background. They knew nothing, not

⁶ The perennial philosophy is a set of metaphysical ideas that developed from the 16th century and that defends the existence of a universal set of truths and values common to all peoples and cultures, which underlies all religions and, in particular, behind the mystical currents within them. *N. from t.*

⁷ “Enlightenment” in the original. This term can mean either “enlightenment” or “enlightenment” depending on the context, and consequently, in this text, it has been translated one way or another depending on the situation. *N. from t.*

only about evolution, but also in general about the vast natural world that sustained them and their societies. They were fiercely anthropocentric and believed in biological and ecological discontinuity. So they sought some inner understanding (inside the human mind), not identification with nature and other wild species. There was not much ecological awareness in them.

Contemporary efforts to “green paint” traditional religions – eco-Christianity, eco-Islam, etc. – are not very convincing. Of course, this does not mean that traditional religions are the cause of anthropogenic, ecological or other problems. They are only consequences and symptoms of living in abnormal conditions. The real causes of ecological destruction and other problems have always been (and are) in material factors - especially population and technological expansion - that have no basis in our evolutionary past and that do not arise through natural selection. Biosocial discontinuity theory is a materialist theory, not an idealist one. All spiritual traditions contain a strong anti-naturalistic undertone or a desire to “transcend” death and suffering (death denial), as does current animal rights theory and other secular ideologies (technological medicine).

Modern secular ideologies - liberalism and its leftist heresies (Marxism, anarchism and others) - offered secular salvation in this world through the conquest of nature, technological expansion, rising standards of living, etc. Such an effort may have eliminated or diminished some human-made problems (such as most infectious diseases or some of the worst types of human exploitation), but it created or worsened many other problems. Such problems cannot be avoided because modern industrial society has created an even greater gulf between human nature and unnatural society. Industrial megacities are the least natural environment in human history, abnormal socially (competitiveness, loneliness, random violence, terrorism, family breakdown...) and ecologically (a polluted, devastated, overcrowded, mechanized and laminated, suitable for robots, but not for organic creatures adapted to the natural wild world). Contemporary efforts to “green paint” secular ideologies – eco-liberalism, eco-Marxism, etc. – are also not very convincing. Basically, they are secular versions of the axial religions.

Accusations against human nature - rather than against civilization - are still alive and well today, even among many secular thinkers. Many Darwinists think that the cause of anthropic problems is competitive and aggressive human nature, or some “dark part” of it. They often emphasize warfare and hierarchy that supposedly have some basis in human nature (Edgerton 1992, Sanderson 2001, LeBlanc 2003, Thayer 2004, Dyer 2006, Livingston 2007, Gar 2008). This obviously recalls the Christian metaphysics of the good (soul, reason) and bad (original sin) aspects of nature and can be understood as its secular version. Which is very ironic since many of these Darwinists - Richard Dawkins being only the most famous - are militant atheists. But from a Darwinian perspective that interpretation makes no sense. How was this radical dualism formed in the human mind? How can natural selection shape two radically opposite forces in a single living thing? How and when was it formed? What is the

"dark side" and the "bright side" in the rest of the species -because they also have to have it (biological continuity)?

Here is the problem: an antagonism between the scientific position and the moral one. The vast majority of Darwinists are liberal humanists who believe in (modern) civilization, historical progress, and contemporary liberal democracy. But liberalism is a humanistic doctrine, basically a secular Christian heresy (Marxism, anarchism, and socialism are liberal heresies with a more egalitarian edge). In many Darwinists there are strong tensions between scientific positions (leading to biosocial discontinuity theory) and moral/political positions (faith in progress and civilizations). For many, civilization must be a kind of sacred cow that cannot be questioned. The standard model of the social sciences (all or almost all human behavior stems from cultural/social conditions) is replaced by the standard model of social Darwinism (all human behavior stems from genetic inheritance), but this is only one of the possible interpretations. The other is the biosocial discontinuity theory. Which I have written about in detail in my book (Markus 2008).

At this point, we can already show the limits of "spiritual enlightenment". In hunter-gatherer societies there is no call for "elevation", "enlightenment", "spiritual wisdom", etc. This is not because hunter-gatherers are ignorant and primitive savages, but because they live in the optimal environment in which basic human needs can be met. When humans have a community, belonging to a place, a clean and wild environment, peace, equality, etc., why do we need to seek "enlightenment"? There is neither ascending nor descending tradition among hunter-gatherers (one of the decisive claims in Ken Wilber's theory). Those positions have their roots in civilization. The ascending tradition (mainly the axial traditions) involves "elevation" above the abnormal social conditions of agrarian civilizations, and the descending tradition (mainly liberalism and other secular ideologies) is linked to the myth of "historical progress". If human beings live in their optimal social and ecological conditions - which are not perfect - there is no need for "elevation" or "progress", since both concepts are symptoms of a deep discontent with the existing living conditions.

Humanistic ideologies - from axial philosophies and religions to their modern secular versions - are constantly in "search for meaning." But man needs to "seek meaning" only if he lives in an abnormal and meaningless society in which he cannot satisfy his basic needs. In the abnormal circumstances of civilizations, "spiritual enlightenment" may be a sensible option for a handful of individuals but not for the vast majority of human beings. Efforts to achieve "wisdom" and a "rational life" in civilization may be honorable and commendable-certainly better than mindless and destructive consumption-but they are also ultimately a kind of escape, an escape from the abnormal social conditions. Contemporary humans can escape to science, philosophy or art, not only to sex, television, the Internet, drugs and other consumer goods, but they have to escape because they live in an unnatural society. Among hunter-gatherers there is no desire to transcend death or suffering because they are a normal part of nature and life, not an abnormal phenomenon.

Science is not a product of certain historical peculiarities, such as the so-called scientific revolution of the seventeenth century or industrial society. The science has its foundations in the cognitive structures of the human brain, which is a product of tens and hundreds of millions of years of biological evolution. Science -as a method to understand the world- exists in all human societies, although in different forms, from knowledge of the local environment to modern abstract and universal knowledge about evolution, the Earth, the cosmos, etc. Science and modern science - and, above all, modern technology - are not the same thing. Therefore, a defense of science is not and does not mean a defense of certain social and historical particularities, such as industrial society or capitalism. For their part, spiritual traditions were and are loaded with metaphysical (not empirical) and idealistic approaches and are not based on human nature. For that reason, science should not incorporate lofty metaphysical theories.

We cannot write here in detail about the practical consequences of this idealistic approach, but the picture is not too good either. Is the change of consciousness the "solution" to the countless anthropic problems of contemporary societies? What about climate change? What about the financial and economic crisis? What about the energy crisis and peak oil (the end of the era of cheap fossil fuels)? What about wars and terrorism? Ecologist and anthropologist Paul Shepard referred to recent human history as "the ten thousand years of crisis" (Shepard 1998a). The dismal state of contemporary humanity could be seen, as many radical ecological thinkers have pointed out in the last 30 or 40 years, as the culmination of a path that began with Neolithic domestication. Environmental historians have shown that many civilizations collapsed due to the devastation of their environmental and energy bases.

(Hughes 2001, 2006, Ponting 2007). Global demographic (significant population reduction) and social (reduction in political, cultural, technological and economic complexity) collapse - not the end of the human species, of course - is a real possibility for the next 40 or 50 years.

The biggest threat is not so much changes in the climate (as many ecologically conscious people think), but the end of the era of cheap fossil fuels, which are absolutely crucial for the normal functioning of mass industrial societies (Kunstler 2006). , Heineberg 2004, 2005, Leggett 2006, Deffeyes 2008, Greer 2008, Newman 2008). For these societies there are no real alternatives at hand, neither at present nor in the immediate future (the so-called "alternatives" are actually technologies for the production of electrical energy, not new sources of energy and all of them are simply derived from fossil fuels).). Peak oil (i.e., the large increase in energy prices in recent years) is the main cause of the recent deep recession - the real end to "growth" - of the global capitalist economy, it is not some kind of a new version of the Great Depression of the 1930s. In 2030 there will be around 8.5 or 9 billion people and oil/gas only for 1.5 billion.

How can a "change of consciousness" or "spiritual enlightenment" help us in this immense disaster? These may be practical for this or that individual, as a consolation

for living in abnormal social circumstances, but they serve no purpose. This is the problem with all the idealistic approaches so typical of spiritual traditions.

CASE STUDY: KEN WILBER

American transcendental thinker and philosopher Ken Wilber is probably the best-known advocate of the "great spiritual tradition" today. His work shows some of the typical limits of the spiritual/idealistic approach. But before continuing, I will make a personal comment. When I came across Wilber's work ten years ago in my twenties, I was very excited by my youthful ideals of "spiritual values" and "moral enlightenment." But now the same thing doesn't happen to me. The theory of biosocial discontinuity supposes a materialistic and naturalistic perspective, since it perceives the material factors -evolutionary inheritance and ecological and social circumstances- as something fundamental. Wilber's position is clearly idealistic.

Metaphysical speculations about "spirit", "mind", "evolution" (in a metaphysical sense), etc. abound in his works. Such matters may or may not be believed, but they cannot be proved by empirical verification. The biosocial discontinuity theory has a higher explanatory value because it can explain not only the cause of anthropic problems, but also the cause and origin of idealistic approaches such as Wilber's. In the worst cases, spiritual traditions became stagnant as religious dogmas and in defense of authoritarian social regimes. At best, the "wisdom" of the great spiritual tradition was a confirmation of some of the basic human needs mentioned above. But it was always an extremely idealistic and anthropocentric perspective, with a strong bias in favor of human exceptionalism and faith in biological (man is not an animal) and ecological (man is not part of nature) discontinuity. Wilber thinks that the fundamental problem is "the lack of understanding and mutual agreement in the noosphere⁸" (Wilber 2000b). Well, a well-to-do Western intellectual may think so, but it is difficult to count the innumerable victims of contemporary anthropic problems. And this is one more example of Wilber's ahistorical and idealistic approach.

A second problem with Wilber's work is that it belongs to the tradition of Hindu mysticism, incorporating certain features of Western idealistic philosophy, such as that of Hegel. It has no substantial connection to modern Western science. Modern science gives primacy to materialistic or naturalistic perspectives or claims that can be empirically demonstrated. Certain scientific disciplines - physics, chemistry, astronomy - are not particularly relevant to human beings and their societies. But others, such as evolutionary biology, ecology, or the social sciences, are of crucial significance.

What value does Wilber's work have from a scientific point of view? Not too much. Two or three years ago, some thinkers -D. Lane, A. Kazlev, F. Visser- pointed out

⁸ From *noos*, intelligence or mind in Greek. Certain Novoeran "thinkers" use this term to refer to the group formed by intelligent beings or their minds; It would be something similar to the biosphere, but taking into account only those beings that are intelligent. *N. from t.*

Wilber's ignorance about biology and evolutionary theories (their works are available at [<http://www.integralworld.net/>][www.integralworld.net]). Wilber knows nothing about them - sociobiology, evolutionary psychology, Darwinian anthropology, evolutionary sociology, etc. - except for several unimportant and always negative comments. Wilber's concepts of evolution and regression are holdovers from 19th century evolutionary social theories and stem from his belief in "progress." But the concept of progress in biological science was long abandoned, as eminent historians of biological thought have pointed out (Ruse 1996, 2006, Bowler 2003). If a certain theoretical coherence is to be maintained, this concept should not have completely different meanings in some sciences than in others. For Darwinists only biological species evolve, not society, the mind or the "spirit".

Wilber's knowledge of the relevant social sciences is not much greater. You are not familiar with the academic critiques of faith in "historical progress" mentioned above. About the theory of biosocial discontinuity and about many of the thinkers mentioned above, Wilber says nothing. He maintains an anachronistic Hobbesian perspective on hunter-gatherers (if he acknowledges them at all, as he often writes about "tribal/traditional/indigenous society" or equally vague and confusing terms), which has long since been abandoned.

In his support, he cites Gerhard Lenski (a historical sociologist who specialized in the history of civilization and who changed his position significantly beginning in the late 1980s) in one book (Wilber 2000b), and in another he cites -incredible but typical of him - a novelist: Michael Crichton (Wilber 2005). This highly superficial approach speaks for itself (for various historical objections to Wilber's work see Rothberg and Kelly 1998, especially Juergen Kremer's article). I repeat, Wilber does not necessarily have to agree with the "revisionist" historical social sciences but he should know them in depth. Otherwise it cannot be taken seriously.

The integral theory cannot be "integral" if it does not contain deep knowledge about the sciences, especially those relevant to humans. But Wilber's theory is a closed and self-referential system, not a system of hypotheses and scientific theories that can be tested and refuted. Thus, it is not surprising that he founded an Integral Institute, and even an Integral University. His disciples are hagiographers, like Brad Reynolds, not serious independent thinkers. *A Brief History of Everything*, perhaps his best-known book, contains a dialogue between Wilber and a certain biased interviewer, who does not critically analyze Wilber's work, but rather poses easy-to-answer questions (Wilber 2000b). In fact, it is not a dialogue at all, but a pure monologue. Wilber cannot expect to be taken seriously - certainly not in the scientific community - if he does not take science seriously.

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¹¹ There is a Spanish translation: *Shadow, I and Spirit: transpersonal psychology essays*, Kairós, Barcelona, 2008.

¹² There is a Spanish translation: *Collapse. Why do some societies endure and others disappear*, Debate, Barcelona, 2006. *N. from trad*

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²³ There is a Spanish translation: *Consilience. The unity of knowledge*, Gutenberg Galaxy, Barcelona, 1999. *N. from t.*

Presentation of "THE GREAT TURNING POINT"

In Untamed Nature we have previously published texts by Tomislav Markus since many of his ideas are very accurate but, as we have also previously pointed out, he was sometimes wrong. The following text dates from 2010 and perhaps its main interest lies in the fact that it is an example of how *not* to do things. Specifically, in this article Markus delves into the same themes (and errors) as in "The twilight of the integral world" (See: [<http://www.naturalezaindomita.com/los-lmites-de-la-iluminacin-espiritual-two-divergent-roads-the-sunset-of-the-integral-world>][<http://www.naturalezaindomita.com/los-lmites-de-la->][<http://www.naturalezaindomita.com/los-limits-of-spiritual-enlightenment-two-divergent-paths-the-sunset-of-the-integral-world>][[spiritual-enlightenment-two-divergent-paths-the-sunset-of-the-integral-world](http://www.naturalezaindomita.com/spiritual-enlightenment-two-divergent-paths-the-sunset-of-the-integral-world)] and

[<http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral>][<http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral>]).

The main errors of this article are three: (1) relying on the calculations, analyzes and estimates made about the amount of existing and extractable fossil fuels, both by official sources and oil companies and the energy sector as well as by believers in peak oil (a fashionable movement at the time). (2) rely on precise forecasts, with precise dates and about exact events, from those same sources about the extraction and "future" availability (as of 2010) of oil and fossil fuels in general, as well as about the consequences that the supposed decline of these will bring to the techno-industrial society. And (3) to sympathize with the so-called Transition Cities Movement and take it as a significant reference, when this is a clearly reformist movement, and even leftist and hippie, despite the fact that the author tries desperately in this text to save face .

And the most unfortunate thing is that Markus could have easily and elegantly avoided these mistakes by being a little more cunning and careful in his expression. Because in general many of the things he says in the article are important and may even probably be true. However, as English speakers often say, the devil is in the details, and it seems that Markus (and many of those the author relied on: peak oil believers) was fooled by Markus.

Let's discuss these errors in more detail:

1. *Reliability of the data handled in the text*: the data on energy production can only come from two sources: the official ones (companies in the energy sector, governments, international agencies, etc.) or the believers in peak oil and the like (people worried

about a possible energy shortage and its consequences for industrial civilization). If you want to handle specific data, you have no choice but to trust these sources. But the question is: are they really reliable? To begin with, none of these sources is totally impartial and independent. Both parties have an interest in manipulating the data in one way or another. Furthermore, regardless of source bias, data on energy production and reserves themselves are inherently unreliable. Even if one really wanted to know for sure how much usable oil, natural gas or coal remains, and had the appropriate means to investigate it, it is really very difficult or impossible to actually know it and, consequently, determine the date of its peak. extraction.[a]

So, if to get a general idea of the global energy situation we start from data that are largely speculative, biased, doubtful and unreliable, the conclusions we draw cannot be very precise and reliable at the same time. And if we insist on these being accurate, as is the case with the author (and those whom he takes as reference), clinging to said data and basing ourselves on it, we will most likely be wrong. And a lot.

2. *Reliability of the forecasts made in the text:* if already the data and the general picture of the global energy situation obtained from them are unreliable, the forecasts based on that picture and dubious data are not they can be very accurate and trustworthy in turn. But there is more, in general and regardless of the reliability of the data handled, the texts that make precise forecasts or/and with more or less specific dates, risk too much of not being right. The development of the processes and dynamics of complex systems, such as the techno-industrial society, depend on so many factors (some of them totally imponderable) that they are to a great extent intrinsically unpredictable and, beyond certain very general notions, it is impossible to say exactly what will happen. to happen in them, when and how. However, the author ventured to give dates that were too exact for events that were too specific and to explain those events in excessive detail... and failed, of course. Thus, according to him, the economic system should have begun to decline from 2008; the states should have entered bankruptcy in 2011 or 2012[b]; since before 2013 or 2014 there should have been a shortage of oil; etc. Unfortunately, the reality today (2020) is that oil has continued to be extracted (even, according to certain sources, increasing the amount extracted), the economy has not collapsed (not even with the serious economic crisis caused by the pandemic caused by SARS-CoV-2; and certainly not because of an energy crisis), the states are still there, etc. So we can get an idea of the reliability of other of the author's predictions in the longer term, such as that in 2025 there will be a demographic and social collapse; For example, in the Wikipedia entry "Peak oil" [https://en.wikipedia.org/wiki/Peak_oil](https://en.wikipedia.org/wiki/Peak_oil;) according to May 2020 access) it can be seen how the proposed dates for peak oil have changed over time, without apparently getting it right in any case. At least for now.

[b] "Even these tough measures will not be able to prevent the bankruptcy of states under crushing deficit and debt in a year or two."

[c] "It will lead to a future supply crisis (physical shortage of oil, perhaps in the next 3-4 years)."

[d] See “Peak oil” Wikipedia:[https://en.wikipedia.org/wiki/Peak_oil][https://en.wikipedia.org/wiki/Peak_oil.]

[e] “From approximately 2025, we can expect a real disintegration of industrial societies and increasingly accelerated processes of demographic (population decline) and social (decrease in political, technological, and economic complexity) collapse.” oil production in 2030 will be half that in 2008[f]; that the population will fall when it reaches 7,500 million people[g]; etc.

Another weak aspect of the predictions of the believers in peak oil is that they have failed to sufficiently take into account the effect of technological development on the development of the techno-industrial social system. For them, technology depends on energy, but never the other way around. However, the relationship between the two is more complex and, although energy is certainly the main variable (without available energy or matter, there can be no technology, obviously), to a certain extent it goes both ways. Specifically, technological improvements, not only with regard to the capacity to extract fossil fuels or the efficiency of fuel consumption by machines, but also to efficiency in the use of energy and materials in general, represent a of the available resources, prolonging the capacity of the techno-industrial system to continue and grow, even without an increase in energy extraction.

Eye ! That we are not saying that a “spontaneous” collapse of the techno-industrial system, the depletion of certain resources, a population decline, or any other of the things that Markus predicts in the article cannot occur. In fact, it is quite likely (although not certain) that many of them will happen sooner or later. What we question are the dates, the causes and the details that this author gives, or in other words, the certainty that these events will unfold in the future and how, why and when they will occur. Not even God knows exactly that, and if by chance Markus were to succeed in any of his forecasts, it would be just that: pure chance. This is like the one who says every year that he is going to die that same year. In the end there inevitably comes a year where he gets it right, but chances are, until that happens, there will be many years where his predictions fail and he makes a fool of himself.

This thing about accurate (and generally unsuccessful) forecasts about the future of the techno-industrial system also has other negative consequences at a strategic level. It is actually an example of the fable of the shepherd and the wolf: in the end people get fed up with being scared and fooled by failed forecasts and stop taking seriously and paying attention to those who make them and even the issues they are dealing with. refer, despite its seriousness.

[f] “In 2030 world oil production will be half the level of 2008, but with around 8.5 billion human beings; by no means a very rosy prospect.”

[g] “Peak energy also means peak population, which will grow over the next few years, to around 7.5 billion, and then start to drop, slowly or quickly, depending on the circumstances.” Compare this with what was said in the above footnote quote. They were? If the population maximum would be 7.5 billion human beings, according to Markus, how could there be 8.5 billion in 2030, also according to Markus?

Be that as it may, today (spring 2020) the world population is already around 7,800 million people.

And not only that, on a psychological level, the strategy of those believers in the imminent peak of oil who at the same time reject the techno-industrial society is very comfortable because it avoids them having to worry about making an effort to bring it down: “Total, it is going to sink her alone due to peak oil one of these days; Why bother trying to fight it?” is what they seem to think. The problem, as we’ve seen, is that it may not go down on its own as easily or as quickly as they *like* to believe.^h

3. *The Transition Movement*: Markus in this text advertises, in our opinion very mistaken, the Transition Movement (called “Transition Towns” -“Transition Towns”- at first ; at the time he wrote that text). The “Transition” thing is pure and simple ecoreformism. The movement was called that because it sought ways to make the transition to a state of oil scarcity as less traumatic as possible *for the techno-industrial society* They defended alternative energies, energy saving and a lot of classic proposals of environmentalism (many of the “alternative” ways of life, organization and production always defended by the most hippie ecologists). And they placed a lot of importance on “community” (which says a lot, and not a good thing, about them; it smacks too much of collectivism, socialism, etc.) But, as much as Markus says that some of their leaders were against industrial society (you know (what did they understand by “industrial society” and for being against it!) or even civilization, in the movement’s propaganda it is not seen that they seek to end them, but rather their survival (prior reform to a state of greater energy independence from fossil fuels and other typical “green” claptrap -sustainable development, permaculture as a panacea, “anti-globalism”, “environmental justice”, etc.-).ⁱ And for a reason they supported them and were interested (and continue to be interested) for them the big environmental groups, or even the administration in many cases. Deep down, Markus’ basic weak values (peace, equality, community, etc.) betrayed him, leading him to support this movement with the aim of mitigating the impact of the supposed collapse of industrial civilization on the people. In the end, his compassionate humanism outweighed his perceptive and correct disdain for civilization. However, the only objective must be the collapse of the techno-industrial society, not to mitigate its social effects, nor to create new “sustainable” communities after it.

These are the three *main* mistakes made by Markus in this article, although they are not the only ones.

[h] About these and other problems of believers in peak oil, you can also see the review of R. Heinberg’s book *The Party Is Over* in Indomitable Nature [<http://www.naturezaindomita.com/resenas/the-party-is-over>][<http://www.naturezaindomita.com/resenas/the-party-is-over>)]

i For information on the movement see for example: [<https://transitionnetwork.org/about-the-movement/>][<https://transitionnetwork.org/about->][<https://transitionnetwork.org/about-the-movement/>][<https://www.eea.europa.eu/>]

themes/sustainability-transitions][<https://www.eea.europa.eu/themes/sustainability-transitions;>]

[<https://geo.coop/content/transition-environmental-movement>][<https://geo.coop/content/transition-environmental-movement;>]

[<https://www.theguardian.com/environment/transition-towns>][<https://www.theguardian.com/environment/transition-towns;>][<https://www.kcet.org/shows/earth-focus/saving-the-environment-one-town-at-a-time-an-introduction-to-the-transition>][<https://www.kcet.org/shows/earth-focus/saving-the-environment-one-town-at-a-time-an-introduction-to-the-transition>][<https://www.kcet.org/shows/earth-focus/saving-the-environment-one-town-at-a-time-an-introduction-to-the-transition>]

[j] Not surprisingly, for example in Spain, after the socialists came to power, the old “Ministry of the Environment” has been renamed, for the umpteenth time, as the “Ministry for the Ecological Transition and the Demographic Challenge”; If someone thought that this “Transition” was not reformist, this mere fact should make them seriously rethink it.

For example, confusing the end of industrial civilization with the end of all civilization is also a serious mistake, which seems to be more of an emotional projection of their subjective desires than a rational conclusion. Unfortunately, civilization in general (the “agricultural civilizations”, as Markus called them) is not going to disappear at all, unless human beings disappear (which is much less likely than the mere collapse of techno-industrial society). There will always be areas where large-scale agriculture through the use of human and animal power is possible and allows the concentration of high population densities around urban centers. One thing is what we would like to see happen (a return to nomadic hunting-gathering) and another is what would really happen in the event of the collapse of techno-industrial civilization (a mere return to non-industrial societies; some of them are surely civilized).

It also remains to be seen what will happen first: the climate collapse, the energy collapse or another type of collapse (due to other causes); if any of them happen.

Nevertheless, the article raises many important and thought-provoking issues, and its value must also be recognized.

THE GREAT TURNING POINT: PEAK OIL AND THE DISINTEGRATION OF INDUSTRIAL CIVILIZATION[1,k]

By Tomislav Markus

I. The rise of industrial civilization and fossil fuels.

Firewood and the work of living beings (human beings and domestic animals) were the main sources of energy[511] in agricultural civilizations. Coal had been used in some regions -such as England since the 14th century or in Song China-, but they were exceptions. Consequently, the vast majority of the population had to live as peasants and in urban environments -cities and towns- lived only between 1 and 10% of the population. Under favorable circumstances the human population grew, depending on the available food, and then collapsed due to starvation and various diseases. Most of the population in agricultural civilizations lived on the brink of starvation and demographic and social crises often occurred. Many agricultural civilizations—the Mayans, the Roman Empire, the ancient Sumerians—severely damaged the ecological foundations of their existence and perished or were significantly weakened. The main ideological forms in the agricultural civilization were the axial religions - Christianity, Islam, Buddhism, Confucianism, etc. - which originally were a protest against social repression and other anthropogenic problems present in their societies, although they quickly became a consolation for the supposedly inevitable human misery.

Faith in “historical progress” - the fundamental metanarrative of all modern secular ideologies¹ - arose due to the discovery of the New World, but became widespread thanks to new energy sources. Traditional economics, from the 17th century to the mid-19th century, especially the highly influential population theory of Thomas Malthus, used to recognize natural limits. However, massive urbanization and the gradual use of oil and natural gas, since the mid-19th century, promoted faith in unlimited natural resources, or, what comes to the same thing, in the unlimited human power to exploit those resources. From there, the modern economy was built on the denial of natural limits and on faith in the ability of the free market to overcome all (temporary) restrictions. For so-called scientific economics, the idea of resource depletion is meaningless, since the free market will always find a solution, either by increasing production (and falling prices) or by finding alternatives. Liberalism, Marxism, and other modern secular ideologies also proclaim their faith in the unlimited power of man’s “conquest of nature.” For them, nature is simply a storehouse of resources that exist for human exploitation and consumption.

The most common explanation for the so-called industrial revolution - a lack of wood in Britain - remains the best, despite much criticism. Other countries had to follow the British example if they did not want to be left behind in international competition. The industrial revolution had many profound social and ecological consequences but, deep down, it was an aggravation and acceleration of the fundamental trends of the last thousands of years: expansion of the population, agriculture and cities; ecological destruction; centralization and bureaucratization; etc. Industrial societies, with their

¹ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

massive urbanization and mechanization, were created in the last 200 years thanks to the discovery and exploitation of new energy resources: coal as the fundamental cause of the first second industrial revolution and oil and gas as causes of the second industrial revolution. New energy sources were crucial factors in the enormous increase in the human population, from less than 1 billion around 1800 to some 7 billion around 2010.² Fossil fuels - energy sources of high quality and density and high net energy value - are the main factor in the creation of industrial civilization in the 19th and 20th centuries, including mass urbanization, mass transportation and the consumer society.³ The entire industrial megastructure, in the last two centuries, has been built on the basis of fossil fuels and their consumption has been growing steadily in recent decades (see graphs I and II). Dependence on oil is not an “addiction” (according to former US President Bush Jr.’s famous phrase that “America is addicted to oil”), since a drug addict can overcome his addiction and quit the drug. However, industrial society cannot “leave” oil; Certainly not in a simple way. In some vital aspects, like transportation or industrial agriculture, oil is absolutely crucial. Technology is not some kind of autonomous force, but only an energy transformer. Technology never creates energy, but only uses available energy, which in industrial society is energy from fossil fuels and their derivatives.

*Graph I: world consumption of several main energy sources 1965-2005*⁴

² An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

³ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁴ A couple of examples:

DISCOURSE ON CLIMATE CHANGE AND THE END OF THE ERA OF FOSSIL FUELS¹

Tomislav Markus

In recent times, the discourse on climate change has gained great importance in public, political and in environmental circles.² Climate -which is usually defined as the average weather in a certain period and in a certain area- on Earth is conditioned by several basic natural factors: solar heat, ocean currents, winds, rainfall, and greenhouse gases, such as carbon dioxide and methane. Their interrelationship is such that, over hundreds of millions of years, it enabled the increase of biodiversity and the existence of hundreds of millions of species. In slightly different circumstances -especially depending on the amount of carbon dioxide in atmosphere- the average temperature on Earth could have been around -20°C, similar to Mars, or + 300°C, like Venus, therefore unsuitable for life. There has been no stable climate in Earth's history; it has already undergone major changes, from the glowing early Hadean period to almost complete icing about 600 million years ago. In recent geological times - in the last 500 million years-, there have not been such extremes, but in the last few million years, climate regularly alternates between glacial (lasting about 100,000 years) and interglacial (10,000 years) periods. Until a generation ago the climate in the Holocene (last 10,000 years) was considered as a relatively constant phenomenon and irrelevant to the history of human societies. With the exception of a few individuals, historians have ignored climatic circumstances. This has changed significantly in recent times, when increasing attention is beginning to be paid to climatic conditions. Climatologists pointed out that the climate in the Holocene was significantly more unstable than previously thought. Some historians have tried to show -there are still ongoing debates- that climate change has

¹ Adaptation made by Ultimo Reducto (from an English translation made with Google Translate) of the last updated version (May 3, 2010) of the article: "Diskurs o klimatskim promjenama I kraj ere fosilnih goriva", originally published in Croatian in *Ekonomska i ekohistorija: casopis za gospodarsku povijest i povijest okolisa*, vol. 5 No. 1, 2009:

² Here we cannot talk about all or most aspects of climate discourse, but, after a short introductory review, we will emphasize its comparison with the issues we consider most important: the end of the era of fossil fuels or, Currently, the second phase in the era of fossil fuels in which world oil extraction has been stagnant on the pick plateau (oil peak) for several years.

significantly affected recent historical circumstances, the rise or fall of some 3 complex societies, and the collapse of some smaller ones.³

The first suspicions that human activities may be the cause of sudden climate change were put forward in the late 19th century by the Swedish chemist Svante Arrhenius, but his analyses were left unnoticed. More detailed analyses appeared in the 1970s. During the 1980s, it began to be written about more often in professional circles. In wider media public discourse about climate issue broke through in the 1990s. And in official politics, after 2000. James Hansen, director of the NASA's Goddard Institute for Space Studies, testified in 1988 before a U.S. congressional committee on the great importance of global warming. In 1992, the United Nations formed a special body, the Intergovernmental Panel on Climate Change (IPCC), with the task of studying the causes, consequences and importance of climate change. This organization is composed of many eminent climatologists, but to a considerable extent, also from environmental activists, often without any scientific education. Climate change forecasting, conducted by the IPCC is based on computer models and simulations, which are called general circulation models and which, using highly sophisticated computers, need to manipulate hundreds of differential equations in order to mimic the Earth's climate. In 2000, the IPCC developed 40 different future scenarios, which were considered equally possible. These scenarios started from the basic premise of business-as-usual and of a continuous increase in extraction and consumption of oil, gas and coal through the following hundred years due to population and standards growth, especially in the countries of the Third World. Different scenarios, depending on the assumed amount of emissions of greenhouse gases, gave different results of increasing surface temperature, from 1.8°C to over 6°C. Later scenarios, after 2006, have moved the upper limit in some scenarios up to 8°C. The vast majority of scenarios consider that there is a critical carbon dioxide concentration point -generally about 450 ppm (parts per million)- beyond which the catastrophic consequences of global warming begin (the so-called runaway global warming). For the past two years Hansen and some other climatologists have been defending that the limit has to be lowered to 350 ppm. Under the Kyoto Protocol -originally drafted in 1997, and to date signed by almost all countries, except the United States and 2 or 3 smaller countries- developed countries are committed to reducing the amount of major gases (carbon dioxide, methane, nitrogen oxides and sulphur hexafluoride) by 5.2% by 2012. Several climate conferences have been held in recent years, the last in Copenhagen in late 2009, where a declaration was signed on the need to reduce greenhouse gases to avoid a temperature increase of more than 2°C. But that declaration is formal in nature and completely non-binding legally, and it has not been signed by all major industrial forces.

When discussing climate change, it is necessary to distinguish facts from mere speculation. The climate on Earth is not static and has changed frequently over a long history. At the beginning -the so-called Hadean period- temperatures were very high

³ Fagan 2001, 2004 and 2009; Linden 2006; and Diamond 2008.

and no life existed. Since the advent of life, 3.5 billion years ago, it has prevailed a colder but relatively warm climate, averaging around 18-20°C. There have been cases of great cooling -the most famous is the so-called Snowball Earth, 600 million years ago, when even the oceans froze- but they have been rarities. Just before approximately 35 million years ago a cooling trend began and the Earth entered a long ice age, when also ice poles in the south and north were formed. This long ice age period was interrupted by short interglacials -we have lived the last 12,000 years in one of them- or, more precisely, periods in which the average temperature is slightly warmer, but which remain part of a long ice age. Climatologists know that greenhouse gases in the atmosphere -especially carbon dioxide and methane- generally contribute to the average temperature rise on the Earth's surface (although not always, because in some ancient cases of global cooling, carbon dioxide levels were significantly higher than today). It is generally believed that their large increase caused a huge temperature increase on Venus and turned the planet into a hot hell with temperatures over 400°C. It has also been reliably established that in the last 150 years there has been a significant increase of greenhouse gases in the Earth's atmosphere. Early in 20th century the levels of carbon dioxide (CO₂), the main greenhouse gas, were about 300 ppm, and today they are about 380 ppm. The carbon dioxide concentration today is at the highest level in the last 420,000 years, perhaps in the last 20 million years. In the last 150 years, average surface temperature has come to increase over 0.7°C. These are the basic facts, which in scientific circles no one disputes.

Sudden climate change is popularly known as “global warming”, which is not entirely accurate, because temperatures have possible significant fluctuations, often in the direction of colder weather, in many local and regional areas. From 1890 to 1990, the world average temperature rose from 0.3°C to 0.6°C. The vast majority of the warmest years occurred from 1987 to the present, and the 1990s was the warmest decade since the 13th century. Most scientists in recent times believe that climate change is caused by human activity, primarily by greenhouse gases (especially carbon dioxide and methane) due to the mass use of fossil fuels. Some scientists, like the climatologist William Ruddiman, have extended this to the whole recent history, believing that man began to significantly influence climatic conditions since Neolithic domestications.⁴ There is a consensus in scientific circles that there is a sudden climate change -there are no climate change deniers- but, contrary to popular opinion, there is no consensus about the cause and, especially, about the consequences. Most scientists and climate activists believe that human activities which lead to the formation of greenhouse gases (the so-called greenhouse effect), in the form of the use of fossil fuels, are crucial.⁵ But a large minority believes that human activities are not the most important cause or that they do not matter at all, because the main causes are certain

⁴ Ruddiman 2007.

⁵ Eg Lovelock 2006, Gore 2007, Lynas 2008, Hansen 2009, and Mathez 2009.

natural phenomena.⁶ They interpret that the causes are diverse, from certain changes on the solar surface to the impacts of the explosions of distant stars.

In political views, there is no significant difference between the two basic camps, the supporters and the deniers of the anthropogenic cause of climate change. Skeptics often mention economic arguments, because they think that the efforts to reduce the emissions of greenhouse gases can have very negative economic consequences.⁷ But affirmers respond that such damages will be compensated many times over by the development of alternative sources energy. Both sides refer to “clean energy”, “clean technology” and the like and more or less they all trust in industrial society, “historical progress” and civilization. Faith in the “free market”, in capitalism and in technological innovation is present in both camps.⁸ The difference is that skeptics believe that the economy will largely depend on fossil fuels, while affirmers believe that it is possible and necessary to achieve a rapid energy transition. But technological optimism and progressivism is the dominant orientation in both camps. However, it is true that those who point out the possibility of catastrophic consequences of climate change are more inclined towards limitationism and the recognition of objective ecological restrictions for human demographic and technical expansion. The anthropogenic cause of the climate change hypothesis could, among other things, gain such rapid acceptance because it could be linked easily to the traditional ecological discourse on “the limits of growth” and “the environmental constraints”. Skeptics emphasize the resilience of the biosphere to anthropogenic activity, including to the release of industrial greenhouse gases, while affirmers emphasize more the fragility and instability of the ecosystem. Skeptics are generally more prone to cornucopian optimism about unlimited human techno-creativity and adaptability than the opposite side. But these are secondary differences, as it can be seen in the fact that skeptics, who advocate more emphatically

⁶ For clarifications of this position, see Singer and Avery 2008, Spencer 2008, and Plimer 2009. Here we will call “affirmers” those who consider that the cause of the sudden climate change is the human use of fossil fuels. , and “skeptics” those who think that human action is irrelevant or that it is not crucial. Some people from the peak oil circles mistakenly claim that there is a scientific consensus about the causes of climate change and that the scientific debate on this is over (Heinberg 2009).

⁷ This concern is irrelevant because industrial societies are so dependent on fossil fuels that they can’t abandon their use voluntarily. Only a deep crisis and an economic contraction, as it has been developing since the summer 2008, may lead to a gradual reduction in the use of fossil fuels. Their complete abandonment would also mean the disappearance of industrial civilization.

⁸ Roy Spencer, one of the skeptics, implies that members of the opposite side are often “environmental fundamentalists” who show a tendency to pagan worship of nature and an antitechnological orientation (Spencer 2008). These political accusations certainly cannot be applied to the vast majority of climatologists, affirmers of anthropogenic climate change who trust in industrial society, “progress” and capitalism as much as their opponents. A typical example is Al Gore, a former US vice president and one of the most famous affirmers, who advocates “green technology” and “alternative energy sources” as the “solution” to climate problems. Other affirmers fantasize about geo-engineering, an artificial atmosphere, space colonies and a saving nuclear energy as “solutions” to the climate crisis (Lovelock 2006, Lynas 2008). In particular, James Lovelock, one of the creators of Gaia-theory, is known for his

cornucopianism (which is still the typical stance of society as a whole), make up a minority in climate circles.

Conventional climate discourse generally assumes that the hitherto climatic conditions were good and climate change is bad. But good and bad for what? For the complex societies and a large numbers of people that emerged during the Holocene? Maybe, but what if that is exactly the problem and if civilization is the source of all major anthropogenic problems? Much of the climate -as well as energy- discourse is motivated by the motto “Save Civilization at all costs!” The defense of climate stability, which in fact means defending civilization, only makes sense if one can show that recent human history has been a progress and that civilization is indeed an “achievement” and an “ascension”. However, this is most often simply assumed as a dogma, both by skeptics and by affirmers, but very rarely as a hypothesis which requires argumentation. Climate stability defense as a defense of social macrodynamics makes no sense if civilization is the source of all major anthropogenic problems.[1680]] Humans as a species have survived many climate changes in the distant past and there is no reason we are not going to do so in the future. The survival of complex forms of social organization is much more problematic, but there is no need to try to maintain them. That is another reason why dramatizing around climate change is greatly exaggerated. And in the worst case scenarios, this would mean the breakdown of complex forms of social organization, which would be something certainly positive, given that this forms of societies are the main cause of the anthropogenic problems of the last few thousand years. Certainly, a social breakdown also implies a demographic breakdown, but this is inevitable anyway, regardless of climate. As species, humans can adapt as well to a greater climate change, to a world 4°C or 5°C warmer. Civilization probably not, but that’s not a bad thing. If we leave the program for “saving civilization” -an impossible task in any case- we can approach the climate (and any other) issue in a new and more constructive way. This can be especially seen in the practical proposals of both sides. Skeptics offer a continuous reliance on fossil fuels (unrealistic because the oil peak is already here), and affirmers offer “alternatives” (also unrealistic, because they are just derivatives of fossil fuels and there is no time for energy transition).⁹ Life on Earth -in one form or another- will certainly continue, because rich biodiversity existed long ago, with a much higher temperature (4°C-7°C) than the present. Affirmers’ discourse on the “fragile” Earth has no basis from a geological perspective, the only legitimate one for our home planet.

Here we are not interested in who is closer to the truth, whether skeptics or affirmers. What is more important is that both parties accept the assumption of an increase in fossil fuel consumption in the next few decades (business-as-usual hypothesis); this is problematic for affirmers, but not for skeptics. Computer models, however sophisticated, are nonetheless large simplifications of reality and are dependent on certain assumptions of climatologists, which can be largely wrong. The results or scenarios

⁹ More details on these issues: Markus 2010.

that the models give depend on the data that are entered into the computer. The basic assumption, as has been said, is a continuous increase in fossil fuel consumption and, on this basis, constantly increasing greenhouse gas emissions over the next 50-100 years. That key assumption is uncritically taken by climatologists from the International Energy Agency (IEA) and individual governments.¹⁰ On this assumption, they make claims about the problematic -or even catastrophic- effects of climate change on human societies and the biosphere generally in the near future. But in the years and decades to come, it's a lot more realistic to expect a gradual reduction in fossil fuel consumption due the deepening of the economic crisis, the reducing demand and the increasing prices. If that scenario is taken into account and entered into the computer models, then the rate of warming turns out much slower and milder, and the worst-case scenario -which assumes an increase in the average temperatures around 6°C or higher- is certainly unrealistic. If the oil peak is already here, as the root cause of the megacrisis of the world economy, then the worst climate scenarios can not be justified. Geologists Colin Campbell and Kjell Aleklett warned back in 2003 that there is "too little oil for global warming", i.e., for the realization of the most catastrophic consequences of climate change. In several later analyzes Aleklett warned that the worst climate scenarios are "plain fantasies", because they are based on completely unrealistic estimates of fossil fuel reserves.¹¹¹² And some other analysts from oil peak circles pointed out the contradiction of giving equal weight to energy and climate changes. Peter Goodchild believes that such a position is in itself contradictory, because if there will be a gradual decline in fossil fuel extraction and consumption, the subsequent conditions of increasing disintegration of industrial societies will lead to a reduction in human 13 environmental impact.

As one of the skeptics noted, relying on sophisticated computer models can impress people with very poor scientific education. But they are just models, at best only rough approximations and large simplifications of an immensely more complex natural world, and at worst distorted reflections of the prejudices of the people who insert

¹⁰ How problematic this approach is can be seen from several facts. About 20 years ago (1985-1990) OPEC countries proclaimed the doubling or tripling of their oil reserves without any evidence (and without any major new discoveries) and to this day they refuse to offer relevant data for verification by independent experts, i.e., they treat these data as a state secret. Until a few years ago, the IEA claimed, in its annual reports, that world oil consumption will increase to 120 million barrels per day (mb/d) by 2030, which has, for the last 2-3 years, been reduced to 105mb /d, without explanation. Until three years ago it was the IEA who argued that peak oil is a matter of the distant future, after 2040, which was revised in 2008 (and 2009) to 2020. In late 2009, two anonymous sources within the IEA confirmed that the agency was systematically lying and inflating data, probably under pressure from the US government. This is a closed circle, because the IEA -and similar institutions- say what governments want to hear, and governments refer to "professional" institutions as confirmation of their optimistic attitudes and forecasts -because governments also say what the public wants to hear. The point is that the words of such institutions can not be trusted.

¹¹ Aleklett & Campbell 2003; Aleklett 2007, and 2010. Aleklett is currently writing a book in which he analyzes these issues in detail.

¹² Goodchild 2009.

the selected data.¹³ Climatologists, who make models on climate change, were until recently completely ignorant about the problems of the oil peak and the end of the era of fossil fuels. Only in the last few years some climatologists and publicists have started mentioning the oil peak saying that it is based on incorrect hypothesis, because they believe that it cannot be of greater importance because the official claims of large reserves of fossil fuels or of the abundant reserves of gas and coal. These analysts believe that increased coal extraction will compensate eventually for the possible oil and gas peaks.¹⁴ This is the weak point of their models, because the belief about continuous growth of fossil fuel consumption is one of the fundamental assumptions that are introduced in the computers. If the dominant opinion is correct -the use of fossil fuels is the root cause of the rise in greenhouse gases, which are the cause of climate change-, then it is impossible to expect any significant reduction in the use of fossil fuels... except in conditions of growing physical scarcity and economic contraction, as is the case since summer 2008. In industrial economies, everything depends on fossil fuels -or net energy, which is obtained from fossil fuels- and its significant reduction would mean economic collapse.¹⁵ It is realistic to expect a significant reduction in their consumption in the near future, not because of the development of “alternatives”, but because of the accelerated exhaustion of the existing reserves and the deepening of the economic and social crisis. In conditions of faster and faster deeper disintegration of oil and gas industrial infrastructure, coal (and other sources) not only will not be able to compensate for the lack of energy, but it is realistic to expect a large reduction in its extraction.¹⁶ Conventional climatic projections predict that business-as-usual will

¹³ Plimer 2009. Roughly speaking, the results you get depend on the data you enter. If the data are wrong -or if they contain some unrealistic assumptions-, the resulting scenarios also become unrealistic. That's, as we will see soon, just the case with the link between climate and energy issues.

¹⁴ Lynas 2008; and Kharecha & Hansen 2008. Bardi 2009 gives an overview of several papers linking climate change and oil peak. Nelder 2009 criticizes the lack of energy issues, especially oil peak, in climatology analyses. One of the reasons for ignoring or minimizing the peak of the energy issue is professional conservatism. If someone has been dealing with the climate issue for 10 or 20 years -convinced that climate change is the biggest threat to industrial societies-, then it's hard to admit that it was all exaggerated and that the biggest threat lay elsewhere. By the way, some climatologists regard oil peak as an example of anti-scientific catastrophism and “doomsterism” (Plimer 2009: 461).

¹⁵ This is the main reason for the failure of the Kyoto Protocol (1997). Even EU countries, which have shown to be the most prepared, will lag far behind the goals set for 2010. This is not a subjective omission, but a consequence of the complete dependence of all industrial economies on fossil fuels, which are, at least According to the dominant view, the root cause of greenhouse gas emissions. Conference in Copenhagen in December 2009 was regarded as a fiasco due to the absence of any document that had binding force. But this “fiasco” is not as big as it was presented, because previous experiences show that the commitments could not be met or were not wanted to be met. On the contrary, the absence of a “binding” document helped to clarify the situation.

¹⁶ Richard Heinberg acknowledges that the energy factor is immediately the biggest problem and threat, but he refuses the opinion that the depletion of fossil fuels eliminates or significantly reduces the problem of climate change. Heinberg believes that oil peak will lead to increased extraction of coal and unconventional oil, as well that technological innovations may make the exploitation of these “unclean” energy sources more profitable in the future (Heinberg 2009a: 113-127). It seems to us, however, that

last for sure until 2050, most probably until 2100, but that was no longer the case... in 2008. The energy peak could be the most significant factor in the gradual reduction of fossil fuels consumption and its impact on climatic conditions. But climatologists know nothing about it, and this factor doesn't input into their computer models either. Some theorists point out that climatologists and the vast majority of natural scientists are unaware of the central importance of the oil peak and that reducing fossil fuels is a much greater threat than climate change.¹⁷ That would mean that the climate change in the coming decades will be more gradual and with less impact than most climatologists think. But to the people of industrial societies this won't be of much help, because for them, a far greater threat is the end of the era of fossil fuels -a process that has nothing to do itself with climate change.

Obviously, the most important question here is how big the real reserves of fossil fuels are, that is, when a peak in oil, gas, and coal extraction can be expected. The big problem are the hiding data from OPEC countries -but also from many Western companies, who often exaggerate the "proven reserves"-, but the events of the latter years seem to have confirmed the opinions of many analysts that their proclaimed reserves are inflated by 30-50%. If the proclaimed reserves were realistic, the OPEC would have controlled oil prices, and Saudi Arabia, with its proclaimed 260 billion barrels of oil, would be the so-called swing producer, the key extractor who can, by increasing extraction, submerge the market and bring down prices. This, although has been the case in recent years, did not happen at the time of high price growth in 2007/2008, because Saudi Arabia reached its oil peak in 2005 -just above 9 mb/d- and could not increase it, even with strong American pressure. Prices have dropped significantly since the summer of 2008, but not because of an increase in "production", but due to a falling demand and the escalation of the great economic crisis. If the OPEC could not increase extraction even in conditions of high prices -whereby their earnings would have been higher - this meant that his reserves were considerably less than those officially proclaimed. While the oil peak has arrived, the gas peak and the coal peak lie in the future, but not distant. Most analysts believe that the peak in the extraction of natural gas (gas peak) can be expected around 2015.¹⁸ There are major ambiguities around coal, but some analysts, such as Richard Heinberg and David Rutledge, believe that conventional views on huge coal reserves have no basis, especially if you mean coal of high energy quality. They put the coal peak around 2025-2030, and this, of course,

a great deepening of the economic and social crises in the coming years will make such extraction increasingly difficult and less cost-effective. Technological innovations require a stable economy, cheap energy and economic growth, and to expect all this in the near (and distant) future is unrealistic. Elsewhere, Heinberg also points to such developments as very realistic (Heinberg 2009c)

¹⁷ Stanton 2006.

¹⁸ Heinberg 2005, and 2007; Kunstler 2006. Gas, along with ethanol and oil sands, was -and is- the most important factor in the maintenance of extracted gross energy (ie, oil in a broad sense, all liquids) on the pick plateau during the last five years (85-87mb/d). Crude oil peaked in late 2004 and at the beginning of 2005 at 74 mb/d and since then it has dropped to 72 mb/d. This has severe economic consequences, because there are no real substitutes for crude oil as the highest quality energy source.

provided there are no major economic disruptions due to the already achieved peak in oil and gas extraction.¹⁹

The discourse on climate change has gained great importance over the last decade or so, not only in narrow scientific and political circles, but also among the general public. Climate conferences have mass media coverage, and the geostrategic implications of climate change have been intensively discussed for several years in political circles. It is ironic that the oil peak and the wider end of the era of fossil fuels, which represent a much greater and more immediate threat to modern industrial societies,²⁰ have had considerably less repercussions in public and political circles. In political circles they have already been talking openly about climate change for 10-15 years more or less, but no one mentions the oil peak, even after the escalation of the great economic crisis of 2008. In oil peak circles there is no internationally recognized and reputable association like the IPCC. The closest to it was the Association for the Study of Peak Oil (ASPO), which has brought together many geologists and analysts, but it has had much less significance on an international scale. It is interesting to compare two conferences which took place almost simultaneously at the end of 2009. In October 2009, the ASPO regular annual conference on the oil peak was held in Denver, Colorado, which brought together all the most important writers and theorists from oil peak circles with a multitude of very informative lectures and discussions. It was a conference very poorly covered by the media, and only the governor of Colorado emerged from the political circles to give an introductory speech. National newspapers and TV stations, in any country, didn't seem to know about the conference at all. The follow-up to the Copenhagen climate conference in December 2009 was completely different, from the mass media coverage, to street demonstrations, to political presence. All states sent their delegations, and many were represented by top officials. Copenhagen was a real media and political circus. From this one would conclude that the oil peak is a much more insignificant and secondary thing in relation to climate change. In reality, however, it is quite the opposite: the oil peak is a much more important and a greater threat.²¹ We have already mentioned some of the reasons for prioritizing the wrong

¹⁹ Heinberg 2009a. For D. Rutledge's views, see his texts and lectures at: <http://rutledge.caltech.edu/> [rutledge.caltech.edu.] Rutledge explains the desperate forecasting (ie, exaggeration) of coal reserves for individual countries yet from the mid-19th century. Rutledge and some other researchers (Robert Brecha, Luis De Sousa, Euan Mearns) consider that coal reserves are too small to have a significant impact on the climate and that, even without regulation, we can expect a maximum of 450-550 ppm CO₂ and an increase in temperature of 1°C (Bardi 2009). All this, of course, provided that the oil peak and gas peak do not lead to a significantly greater economic contraction resulting in that the extraction of coal also has to decline considerably.

²⁰ More about this in Markus 2010.

²¹ Richard Heinberg often emphasized in his works the great importance of both the energy factor and climate change, but his entire work suggests that the first factor is more important, however, because its effects will be felt much faster and more immediately. Heinberg criticizes climate activists and scientists, who believe that climate change is the only thing that matters and who ignores the oil peak and the energy crisis in general (Heinberg 2009b, and 2010). Heinberg points out that the

things, like people believing they can “solve” “problems” and continuing the traditional environmental discourse. The picture of a fragile and unstable Earth, threatened by an aggressive humanity has been very common in the environmental circles of the last 3040 years and many have believed it. But the most important reason is probably that climate change is perceived as an external threat; it is dangerous for many, but comes from outside and human societies can mobilize against it, and in some way, adapt to it. Although this threat was created -according to the dominant opinion- by human activities, people can “fight” against it like against an “enemy”. The end of the fossil fuel era cannot be understood that way. It is a deep internal threat; it acts very quickly; it affects all aspects of the industrial society; and there is no possible “mobilization” against it. As some analysts have pointed out,²² unlike the climate discourse, the oil peak is politically incorrect, because it does not indicate abstract, but very concrete ecological limits and, at the very least, shatters all hope about increasing and even maintaining the existing standards of people. But, much worse, it contains a very real threat of demographic and social collapse of mass proportions in a very near future, while only the worst climate projections speak of a possible breakdown in some distant future.

The analysis so far indicates that the discourse on climate change is largely exaggerated and that it implies giving priority to the wrong things. Some consequences of the climate change can be bad (desertification, flooding of coastal areas, more frequent heat waves, tropical storms and hurricanes, etc.), and others can be good, like mild winters, but that’s not crucial. The worst-case scenarios around climate change would be realistic if there were an abundance of cheap energy, but then there would also be a possibility of successful adaptation of the industrial societies to climate change. Many analysts believe that the energy peak and climate change are more or less equally important and they must be considered together.²³ We do not question the latter, but the fact is that both problems -climate change and the end of the fossil fuel era- may not be equally important. Climatologists would not even make alarming forecasts if they did not believe in the official claims of huge energy reserves, i.e., that the peak of the energy is something of a distant future. The great economic crisis and the contraction of the world economy, as they have been developing since the summer of 2008, certainly have nothing to do with climate change, but they have all to do with the peak of the energy, i.e., the fact that world oil extraction have not grown significantly since the end of 2004, and has not grown at all since the summer of 2008, even with “unconventional” sources. The events of recent years confirm the thesis that the energy peak has greater significance because its effects are felt much faster and more immediately. Climate change -if we can declare any event to be its consequence at all acts

participants in the Copenhagen gathering lived in a conceptually fantastic world because they ignored the peak of energy and the population problem, believing that the old expanding economy can be rebuilt (Heinberg 2010).

²² Bardi 2007.

²³ Leggett 2006, Heinberg 2007, Astyk 2009.

much slower and contains much more uncertainty. Governments and other institutions need to change priorities and give the energy issue a key place, preferably without fantasizing about “alternatives”, “clean energy/technology”, “green revolution”, “energy independence” and other constructions, which have become popular in recent years as energy -and thus economic- crisis has been deepening. Kyoto Protocol and similar human (dis-)agreements are irrelevant, because environmental constraints (i.e., the peak of the energy) -not human regulation- will ensure limited greenhouse gas emissions.

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Leftism, Techno-Industrial System and Wild Nature¹

By Karaçam (August 2020)

Introduction

Today, when it comes to anti-system rebellion and changing the “order,” what is generally understood is a set of leftist views and behaviours instead of a movement that takes wild Nature as the core value and wants to destroy the techno-industrial system to protect wildness. At first glance, it seems that there is a similarity and intersection between these two very different worldviews: leftism and a movement that seeks a system change (or rather the elimination of the physical infrastructure of the existing technological system).² This seeming similarity and the confusion emanating from it are one of the biggest obstacles to the formation of an effective movement against the technological system. Therefore, it is essential to reveal the huge differences between these two currents in order to establish an effective movement against the techno-industrial system.

Leftism

So what is leftism? Leftist thought emerged with the Enlightenment, developed with the industrial society that started to emerge in almost the same period, and constitutes the basic value system of the industrial-technological system. We can say that leftism passed through three stages since the 18[th] century, when it emerged. The first stage was constituted by the currents that defended rational thought against traditions and religion, the dominance of scientific and rational thinking in the management of society, the equality of people before the law, the abolition of the privileges of the aristocracy, the removal of the church’s influence in economy and society, the replacement of monarchies by republics and the realization of parliamentary management systems

¹ I would like to thank Último Reducto [<https://ultimoreductosalvaje.blogspot.com/>](<https://ultimoreductosalvaj.e.blogspot.com/>) for his comments, suggestions and corrections. Without his help this paper would not have been possible in its present form.

² Especially with the green anarchist and anarcho-primitivist variants of leftism.

and government administrations, increasing material prosperity and completely eliminating poverty, etc. and it was what socialist leftists later would call the bourgeois left. This first wave left crystallized and expressed the ideas of the new society that were being built in Western Europe and North America then. The main pillar of the first wave left's world-view was that humanity, with its rational thinking, science, and technology, had an omnipotent power over Nature and society and therefore the ability to create on earth the most perfect and materially abundant society by deciphering the secrets of the universe; and all the other subsequent waves and forms of the left inherited this idea.

The second wave of the left was socialism who advocated that the "perfect" society can only be established by the general distribution of material abundance to every segment of society and the way to achieve this would be the total collectivization and rational control of the economic activity. Socialist left's first manifestation was during the French Revolution with Babeuf and his *Conspiracy of the Equals*. Henri de Saint Simon and Charles Fourier developed the socialist ideas as a continuation of the Enlightenment and the first wave bourgeois left during the first half of the 19[th] century. They preached that brotherhood of men with the combination of the science and industry would bring paradise on Earth. In the first industrialized country of the world, Britain, Chartist Movement demonstrated the political power of the new mass urban proletariat during the 1830s. By the second half of the 19[th] century, Marx and Engels shaped the final ideological contours of the second wave left by tying it intrinsically with technological development. According to this, a classless, stateless, most prosperous and perfect society will arise with the technological development. And as industry developed and urban proletariat became more and more numerous, the political power of the second wave left increased.

Socialist left claimed that they were defending the rights of the lowest, poorest and most dispossessed classes in society, especially the new working class that had emerged with the industrial revolution. In addition to the developments that the radical bourgeois leftists wanted to happen, socialist leftists wanted to implement a complete socialization in the economic sphere - establishing a rational and planned social system through the full collectivization of the production and consumption activities of the society and thus expanding the material abundance to every member of the society. As a result of the activities of this second left wave, the technoindustrial system was established in Western Europe and North America by fully integrating the masses that make up the labour force it needed to continue its activities. The relatively stable³ system which has settled completely in the developed western countries after the Second World War, has proved to be more successful and financially abundant than the command economies of the Eastern bloc countries. However, in accordance with

³ Due to the accelerated technological development it incorporates, techno-industrial society is very dynamic and constant change is an inherent part of this society. What I refer here as social stability is the smooth functioning of the social machine without disruptions.

the development of the technoindustrial system, traditional agricultural societies were completely dispersed and, as a result, major changes took place in traditional values, family structure, daily life, etc. From the midsixties, the results of these developments have produced a third left wave. A new left wave that claims to identify with and defend the oppressed groups in society, focuses directly on people's daily lives and behaviours and uses them to better socialize⁴ people in order to increase social cohesion and stability.

With all these forms it has assumed throughout history, the left has provided the values and behaviours necessary for the social system that emerged with the industrial revolution to develop and stabilize itself, and to complete its shortcomings, by obtaining the consent of the people. With this role that it plays in the system, the left is the main ideology, which is part of the superstructure of the techno-industrial system. It contains the theories on institutions, forms of behaviour, norms and values necessary for the efficient functioning of the highly complex techno-industrial system: Social solidarity, non-violence, equality before the law, freedom to perform surrogate activities⁵ controlled by the system, social responsibility, importance to merit; in short, the sum of all the values which are constantly pumped in the mainstream media and the education system, and which try to turn people into good citizens. These values emerge as the complexity of the society, the number of people living physically together, the number of components of the system, and the intensification of the relationships between these components increase, because leftist values enable the techno-industrial system to survive, function more efficiently and be stronger by putting millions of

⁴ I use the term socialization here as Theodore John Kaczynski uses it in *Industrial Society and Its Future*, ^ 24: "Psychologists use the term 'socialization' to designate the process by which children They are trained to think and act as society demands. A person is said to be well socialized if he believes in and obeys the moral code of his society and fits in well as a functioning part of that society. [...]" In this definition Kaczynski refers especially to the children, but in fact socialization acts also on adults, though usually not so easily and intensely.

⁵ In modern techno-industrial system, fundamental needs (shelter, food, security, etc.) of the people are supplied by the social collectivity without a meaningful effort on part of the members of this society. Many people might spend hours of time in their jobs, but for most people the things they do are not directly related to their fundamental physical needs and they do absurd, monotonous, minutely divided tasks which are not intellectually and physically stimulating. But *Homo sapiens*, during the millions of years of evolutionary process, acquired a biological need of being active in order to satisfy his needs with his own effort, and this process of using one's own talents and capacities in order to satisfy his fundamental needs is crucial for one's psychological health. When the most important needs are satisfied by the social collective, people find themselves in a vacuum. And this vacuum needs to be filled with other activities in order to alleviate the grossest consequent psychological disturbances that would greatly harm the system and perhaps make its functioning impossible. Since these activities (climbing the corporate ladder, devotion to a scientific or a specific research area, hobbies, consumption of the system's commodities, dedication to the solution of issues such as environmental problems, racism, sexism, etc.) are not directly related to the satisfaction of the fundamental needs and try to substitute the effort that would normally be exerted in order to satisfy them, they are called surrogate activities. For a more detailed discussion of the concept of surrogate activities see Kaczynski, *Industrial Society and Its Future*, fl 38-41.

people to work together in a coordinated manner. Leftism is not against the techno-industrial system; on the contrary, it acts as insurance for this system. By adopting the fundamental values of the techno-industrial system and pushing them beyond the mainstream of this society, it controls how well people comply with these values and forces them to change themselves in line with these values. Thanks to this relationship with leftism, the techno-industrial system corrects itself and constantly enhances the efficiency of its own functioning. Every topic in which leftist ideology criticizes the system, such as gender inequality, ethnic problems, environmental problems, bribery, nepotism, violence exerted by individuals towards each other in society, etc. consists, in fact, of the problems that the system faces in order to keep on functioning and developing itself smoothly, so if the system resolves them, it will work more efficiently. Leftism helps the system to identify and face these problems, and thus to solve them and function better.

The techno-industrial system expands its activities to the extent that its problems are solved and it grows by destroying, subjugating and replacing wild Nature. Consequently, there is an insurmountable contrast between the values that oppose the techno-industrial system in the name of wild Nature and the leftist ideology, which is based on the values of this very system and helps it to improve its functioning and to develop itself.

Wild Nature

Wild Nature refers to the ecosystems that exist and function on their own, apart from the intervention of complex human communities. Wild biological species, including primitive humans, acquired through a natural selection process some biological features that determined the behaviour, feelings, and living conditions that were suitable for them. Nature enabled them to acquire these features, and the existence of these species, together with the non-living natural environment, without the intervention of complex societies, constitutes wild Nature. The emergence of complex societies was a gradual process of human communities becoming systems that control and regulate natural processes for their own growth and self preservation.⁶ The interference of human societies with wild Nature greatly intensified and changed qualitatively with moving to settled life and domestication. The genetics of plants began to be regulated through agricultural activities, by the needs of complex human communities instead of by natural selection, and likewise some wild animals were subjected to an artificial

⁶ I define complex societies, as Tainter does in *The Collapse of Complex Societies*, as those societies which have inequalities (characterized as vertical differentiation, ranking, or unequal access to material and social resources) and heterogeneity (referring to the number of distinctive parts or components of a society, and at the same time to the ways in which the population is distributed among these parts) in its composition. See, Tainter, *The Collapse of Complex Societies*, 2005, Cambridge University Press, Chapter 2, "The Nature of Complex Societies".

genetic selection through the livestock activities, thereby creating domestic species that were not found previously in the wild. This process expanded and intensified gradually. The fact that human communities began to meet their nutritional needs by directly producing their own nutrients, instead of hunting and gathering, enabled them to generate a large surplus of energy compared to the nomadic hunter-gatherer lifestyle. This surplus of energy led to the demographic growth of these established agricultural societies and to the formation of classes and components within these societies that performed different functions in them.⁷ The agrarian societies that had accumulated more population and material power greatly increased their geographical dimensions and started to spread all over the world. Since these complex societies destroyed the autonomous functions of the wild in favour of their artificial functions, their spread over the world meant the gradual destruction and narrowing of the wild. Wild ecosystems were increasingly transformed into settlements, fields or pastures, along with wild animals and plants, many of which were transformed into domestic species or just eliminated. Nomadic hunter-gatherer human communities remained only in the ever fewer remote and non-civilized parts of the world due to this geographic spread of complex communities. It is the complex societies' physical technological infrastructure and demography that gives them their material power. Technological infrastructure gives complex societies the power to absorb and transform the natural processes and resources into their own activities and structure and feed bigger populations. Thus, as the rate of technological development accelerates, the expansion of human societies at the cost of the destruction and subjugation of wild Nature also accelerates. For this reason, in techno-industrial societies (complex societies emerged since industrial revolution), which can absorb the energy of fossil fuels into their own metabolism, the destruction and subjugation of wild Nature has become much faster and larger, and this speed and scope will increase as the technological development continues.

Homo sapiens is the result of hundreds of millennia of nomadic hunter-gatherer lifestyle. Our physical and mental structure has evolved in accordance with this lifestyle. Although they varied in different parts of the world, according to different fauna and flora, and climatic conditions - i.e., to different ecosystems-, the nomadic hunter-gatherer lifestyles were based on people meeting their vital needs through their autonomous activities within wild Nature. Nomadic hunter-gatherer human societies never included as many individuals as not to allow everyone directly know any other. This prevented the occurrence of different classes and components in these communities and allowed people to perform the activities to meet their physical needs directly and autonomously, without being reduced to a tiny part of a large collective.⁸ This

⁷ Those hunter-gatherer societies which had very rich stationary food resources also developed specializations, classes and components. But in the absence of food production, these phenomena would have been limited to places where those rich stationary food resources existed and would not have spread to the same extent of the sedentary, food-producing societies.

⁸ Not only nomadic hunter-gatherer societies, but some isolated horticulturalist societies (eg, isolated Amazonian tribes, like the Siriono or the Machiguenga) have also these characteristics of autonomy,

way of life was not the Garden of Eden pictured by anarcho-primitivist leftists, where there were no physical efforts and difficulties, everything was abundant, and flower children were playing all day, but it was a lifestyle that allowed people to express their natural tendencies freely in an environment to which they were adapted.

Complex societies

People all over the world lived a nomadic hunter-gatherer lifestyle until about ten thousand years ago. The time-frame that has passed since is too short to make any kind of meaningful genetic change. Therefore, current humankind is a species of living being trapped in such life conditions that do not fit its natural structure. With the agricultural revolution and food production, complex societies emerged in which people was forced to live outside the lifestyle and environment where their natural psychological characteristics had developed, so their natural behaviours tended to be unsuitable for the cohesion and the efficient functioning of these societies. For this reason, people living in complex societies also had to be “tamed” and socialized to ensure that these complex crowded societies functioned steadily.

Complex societies, which appeared with the intensification of agriculture and animal husbandry and the resulting enlargement of settled societies, had much larger populations compared to nomadic hunter-gatherer communities. There appeared occupational specializations in these complex societies. They began to include different classes such as soldiers, clergy, bureaucrats, farmers, slaves. Since the structure of these societies was complex, people had to specialize in a particular activity, they had to meet their needs as part of a large collective, instead of through their own autonomous activities. They had to stay in a crowded environment, apart from the natural environment to which they had adapted through millions of years, and they had to adopt a lifestyle that was not suitable for their nature. People trapped in these complex societies were in a situation where they could not freely express their wild nature. As technology evolved, the size and complexity of societies increased. This increased social hierarchy, division of labour, and therefore the collectivistic character of these communities and led people to live lives that were ever more disconnected from their own nature. They needed to live together and cooperate with an anonymous crowd, they needed to undertake tasks which were neither physically nor mentally appropriate to their human nature, they found themselves in social structures which eliminated their autonomy and took away the initiative from their lives, they lost the contact with wild Nature and were confined to artificial environments. (With the advent of the techno-industrial societies this has gone to extreme degrees: many members of these societies aren't aware of the existence of wild Nature and some even have gone as far as to

mutual knowledge and absence of classes. Therefore it seems that these traits depend strongly on group's population size and density and there is a gradual fading of these traits as population size and density increases with the advent of more intensified food production methods.

claim that it has never existed.) Being sentenced to such a life led to some physical and psychological problems. These problems needed to be alleviated and kept at a level that would not hinder the efficient functioning of these societies. In other words, people should be adjusted to the lifestyle of a society that does not conform to their own natural impulses. And this adjustment has entailed the ever stricter control of the human behaviour.

The great gods

Complex societies, in order to function and survive, needed to create a social cohesion, a narrative of unity, an ideology of togetherness and the necessary moral codes and values to make large numbers of people to behave in appropriate ways in the context of crowded mass societies. The first method used by agrarian societies in order to achieve this was the great gods.⁹ Great gods track people everywhere, evaluate their behaviour according to moral principles and punish or reward people based on how much they adhere to these principles. Living in large social groups was a phenomenon that appeared at a certain stage in history, with the emergence of complex societies. Prior to this, people did not live surrounded by people they did not know, in crowded and large communities. The beginning of this kind of life was a very new event for human history. The longest period of human history, before this, had been spent in small communities where individuals had daily relationships with just a small number of people. In these small communities, strangers, that is, individuals from outside the group who were not directly known, were viewed with suspicion. In complex societies however, individuals have to live their lives surrounded by a large number of people they do not know and have to cooperate with them for their own physical needs, shelter and defense.

Solidarity developed in small communities (communities small enough to let people know each other directly) through kin selection and mutual or reciprocal altruism. According to the principle of kin selection, we help our relatives because they share the same genes with us at a certain rate. Thus, helping them we increase the chances of their genes to continue, and thus, we indirectly increase the chances of our own genes to continue themselves in those relatives. And given that the members in small primitive social groups used to be relatives, human individuals evolved to help and take care predominantly of that people who they closely know, and with whom they

⁹ For the concept of the great gods as a means of forcing people to behave in complex societies, see, Ara Norenzayan, *Big Gods: How Religion Transformed Cooperation and Conflict*, Princeton University Press, 2013. Norenzayan seems to think that one of the reasons for the emergence of complex societies was that people began to believe in great gods. But in my view, the emergence of great god religions is a solution to the problem of the cooperation required for the survival of the complex societies that emerged as a result of human societies moving to sedentism and food production (agriculture and animal husbandry) for material reasons (hunter-gatherer societies reaching the carrying capacity of their ecosystem). Of course, religions are not just about this solution.

share their lives and maintain a close and friendly relationship. Reciprocal altruism is that individuals help each other in a mutual interest relationship. People increase their total benefits by helping each other alternately. But this mutual aid has to be based on a mutual trust relationship. So I have to know that the person I am going to help now will help me when the time comes. This is possible only by knowing that person and knowing what he usually does in similar situations. Therefore, mutual aid tends to occur among people who know each other face to face, intersect their lives and will do mutual work in the future. The groups founded on the principle of mutual aid have developed various mechanisms to punish people who receive help from others but do not give it in return. In small groups where everyone knows each other and people will live in the same social environment for life, it is much easier to ensure that this follow-up activity maintains the principles of mutual assistance than in large groups where people do not know each other. In these small communities people know each other, they live together, and they will hunt, make a shelter or gather fruit together in the future. Therefore, it is difficult to leave an aid free of charge. Because the person you owe is always there, he knows you, and tomorrow, you will need the help of that person again. But in large-scale societies, the situation is different. People don't know each other directly. They do not always deal with the same people. Solidarity in these societies is not exactly mutual. It is more like a chain reaction. An anonymous crowd, genetically foreign to each other, is constantly involved in a huge cooperation. Assistance without some extra precautions can turn into selfish utilitarianism in crowded groups. For this reason, in complex societies, much more sophisticated methods of socialization were developed to ensure solidarity among its members, and along with it, cohesion, stability and thus the continuity of the society. The most important of these were the great gods who make moral commandments.

Anthropologists warn us about reaching conclusions on ancient hunter-gatherer societies which existed prior to 12.000 years ago when there was no food production anywhere in the world, based on the observations made on recent modern-day hunter-gatherer peoples. Despite some important common characteristics, there are differences even among modern-day hunter-gatherer societies which have been observed by the anthropologists. They present considerable differences in group size, social complexity and cultural traits. Modern-day hunter-gatherers occupy marginal lands on Earth which are not claimed by complex settled societies, but they may have had relations with those societies which may have affected their cultural traits, social organization, daily activities, etc. A long period of time has passed since the advent of food production and the constitution of sedentary complex societies, and during this long time period, some differences may have occurred between ancient hunter-gatherer societies and modern-day hunter-gatherer societies due to reasons that we are not aware of now. With these caveats in mind, modern day hunter-gatherer communities offer us a glimpse into our past and it is possible to make plausible hypothesis about our hunter-gatherer past using the observations made on modern-day hunter-gatherer societies. Thus, anthropologist Marlowe, who has lived with the Hadza (a hunter-gatherer so-

ciety in Tanzania living around the shores of Lake Eyasi) makes these observations about their religious beliefs:

I think one can say that the Hadza do have a religion, certainly a cosmology anyway, but it bears little resemblance to what most of us in complex societies (with Christianity, Islam, Hinduism, etc.) think of as religion. There are no churches, preachers, leaders, or religious guardians, no idols or images of gods, no regular organized meetings, no religious morality, no belief in an afterlife - theirs is nothing like the major religions.¹⁰

We have similar observations on some other hunter-gatherer people. According to Norenzayan's quote from Marshall:

Among the San in the Kalahari, for example, 'Man's wrong-doing against man is not left to Gao!na's [the local god] punishment nor is it considered to be his concern. Man corrects or avenges such wrong-doings himself in his social context.'¹¹

Unlike in small communities, the religious beliefs and gods of people living in complex societies are very closely interested in moral issues such as theft, lying, and non-compliance to agreements. Unlike the gods of complex societies, the gods of small groups cannot see everything and are not able to do everything. Because in order to ensure solidarity in small communities, there is no need for gods who can see everything and monitor whether people act, or even think, in accordance with moral norms. The behaviour of people who do not follow social rules in small groups is noticed by the members of the group. It seems that the gods who watch everything, who want to shape the behaviour of people according to certain moral principles, started to appear 10,000-8,000 years ago when people started to live in large communities, and this notion of god spread with the expansion of these large communities.

Therefore, in order to ensure stability and cohesion, realize solidarity and continue to live in large communities, members of these communities needed to follow extended and more intensified moral rules. The first way to set these moral rules and to see if they were followed was the belief in great gods. Great gods encourage sharing, solidarity and honesty. On the other hand, in complex societies, these values act as cement that anonymously bring together a large number of people who do not know each other. They help them to collaborate and to live together. With the discourse that those who belong to the same religion in the society are siblings, a sense of pseudo-kin and a general social solidarity are intended to be created among individuals who actually are foreign to each other. This was the first method developed by rulers of the complex societies who used the great gods to establish this social solidarity. Since people had to live in large crowds with persons that they did not know and had to cooperate with them, new complex moral norms were created and great gods began to watch at every

¹⁰ Norenzayan A., (2013). *Big Gods: How Religion Transformed Cooperation and Conflict*, Princeton University Press, Chapter 7, quoting Marlowe, FW (2010). *The Hadza: Hunter-Gatherers of Tanzania*, Berkeley: University of California Press, p. 61.

¹¹ Norenzayan A., *ibid*, citing Marshall, L. (1962). Kung bushman religious beliefs. *Journal of the International African Institute*, 32, p. 221-252.

moment to check if people were following these norms. Believing in a great god, and following the rituals and procedures of social devotion brought about by it created the tools that hold large communities together. They made members of the society more connected, which in turn increased the stability and cohesion of the society.

With the development of technology, modern complex societies began to develop more effective methods than the great gods to socialize people and control their behaviour. The means and the capacity of detecting, finding, and punishing those who do not comply with the rules set by the society were greatly increased by the technological development. Modern, state sponsored compulsory education systems and mass communications media gave the rulers of the complex societies more effective means of propaganda in order to inculcate the fundamental values of the society. With the anonymization of the judicial and punitive institutions and their all-reaching power, the commonly shared belief that the judiciary is independent, that it will apply social norms in any case, and that its power will be sufficient for everyone, settled in the society. The belief in the existence of all-watching gods tended to decrease, as the trust in the secular institutions' power and will to implement the social norms in a neutral way in all situations increased. Instead of the teachings and moral stories of the great god religions, people started to be bombarded with leftist values by all sorts of communication and propaganda techniques; and instead of the invisible big gods, people started to believe in and trust more tangible secular • 12 1 • 12 institutions.

The role played by the great gods and moral-based religions in ancient complex societies shows that complex societies, which include large number of people who do not know each other directly and have to make these people work in cooperation with each other, must control and guide their members' behaviour. And in order to achieve this control and guidance, certain ideological systems which represent society as one big family are necessary: Ideologies emphasizing solidarity, mutual trust and regulating human behaviour with complex moral principles. In modern industrial societies, in which the collective character of the society has increased even more, leftism is an ideology that has a similar function and it is actually related to those old great god religions (especially to Christianity, with its emphasis on non-violence and solidarity, to a certain extent).¹²¹³ Leftist values are the values of the techno-industrial system that emerged with the industrial revolution. The main function of these values is to increase the solidarity and cohesion in the society and remove the roughness between the gears of the social wheels.

¹² Modern Western Europe and especially Scandinavian countries are examples of this situation.

¹³ Christianity and leftist ideologies have always had common ethical values. Social solidarity and sacrifice, a hatred of individual ambitions related to materialism, a suspicion that individuality will negatively affect the general well-being of society, equality (before God for Christianity and before law/the State for the left), and compassion for the weak and oppressed are the foundations of both Christianity and the left's value judgments. The adherents of these belief systems also tend to share similar psychological traits and inclinations: low self-esteem, inferiority feelings, guilt, etc.

Progress

One of the basic beliefs of the leftist world-view is progress. This belief or illusion implies that history flows in a certain direction, in accordance with a certain ideal over time. According to this belief, as people learn more about the universe, expand their general knowledge, apply this knowledge to technological development and dominate Nature using this technology, their societies are also evolving towards a more comfortable, more prosperous, more enlightened and more humane point as they eliminate misery and scarcity thanks to technological development. Thus, false beliefs and superstitions from the past disappear and an increasingly happier, free and prosperous human society emerges. In this process of development, human beings become more humanized by educating themselves and, by being civilized, they separate themselves from their animal roots. This belief, developed in detail by the Enlightenment philosophers of the 18[th] century¹⁴ and shared by the intellectual classes of society, forms the basic pillar of the left's world-view. Without the concept of progress, the leftist world-view loses its meaning. The left's desperate hope for the future and pathological dissatisfaction for the present finds its expression in this concept. No matter how bad it is now, the future will be better. But some malevolent and reactionary forces prevent this development from happening. According to leftists, those who believe in progress should also struggle against the reactionary elements that try to prevent it, and they must open the way for this inevitable advance.

First wave leftism: The radical bourgeoisie

According to leftist progressives, what the development of science and technology leads to is the emergence of a more prosperous, egalitarian and free society over time, making life easier. But the wicked mislead this way. Historically, these villains have taken the form of kings, clergy, tsars, imperialists, capitalists, property owners, etc. Leftists have fought against them for the future utopian society. As advocates of the "happy" and "perfect" form of society created by the development of science and technology, leftists fight for the social values and institutions that this development will require. In the 18[th] century when it first appeared, the left was perceived as defending the values of the new order against the old order. In the beginning of the Enlightenment period and during the transition from agricultural communities to industrial societies, the left, as the defender of the principle of progress and the new order against the old order, advocated equality, reason and freedom by coming against family, authority and religion. These were the values of the emerging industrial society. As industrial society required the integration of science with technology, the guiding role of religion and the beliefs emanating from it had to be rejected. The basic production unit of the society was not the family any more, but it was becoming the larger scale organized factory.

¹⁴ According to Bury, the idea of constant, quasi automatic progress with time, incorporating social development and refining of the human character too, fully developed during the Enlightenment in the 18[th] century. For the evolution of the idea of progress see JB Bury, *The Idea of Progress: An Inquiry into its Origin and Growth*, Macmillan and Co., Limited, London, 1920.

Production was taking on a more collective structure that required the gathering of many people who did not know each other. The peasants flowed into the cities to work in factories, becoming workers, and this required the destruction of the old, inelastic, unequal, caste and discriminatory structure of the society. For this reason, the power of the extended family had to be broken in favour of the social collective.

People had to be attached to the social system itself, above all the particular classes or social subgroups. So they became citizens with “equal rights.” Since what the system needs is the technical skills and abilities of people, they had to be evaluated according to their abilities, regardless of any other privileges. For this reason, people had to be “equal.” Real equality, i.e., the elimination or overlooking of all the differences, is impossible. Because everybody is different by nature or the circumstances. Therefore, what leftists did as defenders of the “equality” was much more nuanced in the real life than a basic defence of a general, fundamental idea of “equality.” As advocates of “equality,” bourgeois leftists were focusing at that time on the elimination of nobility and clergy privileges, the old order’s rigid social structure which prevented the efficient use of the talents of some people. When the allocation of the positions of power, wealth, benefits and commodities a society has to offer is done according to some hereditary privileges, this results in an inefficient sharing of the roles in society and blocks the desired people who has the talents to assume the adequate positions suitable to their capacities. Thus, by advocating “equality,” they were trying to break the aristocracy’s and clergy’s grip on the society, thereby assuming the leadership role and also opening the way for the talented people to the high positions and thus increasing the society’s overall efficiency.¹⁵

A very similar thing happened with another cherished idea of the left, “freedom.” Left, in all its variants and since its early origins, never regarded freedom as the ability to take one’s own life conditions, one’s life-and-death issues, into his own hands autonomously, but defined it in various quite different (even incompatible) fashions according to the different circumstances and to the different needs of the moment.¹⁶ During the Enlightenment era and at the birth of the industrial societies, first wave left defined freedom as to be exempt from the old society’s restrictions, privileges, and pre-arranged roles based on the heredity, class, age, etc. The consequence of this definition of freedom in the economic field was to regard the citizen as a free economic agent. This in turn legitimized the destruction of the serfdom and the old guild system. These rigid old production systems were inhibiting the economic activity, hindering the

¹⁵ As we will see below, the second wave leftists, the socialists, would act in defense of “equality” too. This time they would be struggling against the too gross differences in the distribution of wealth in order to prevent the social problems which would have created disturbances in the functioning of the system.

¹⁶ In fact leftism sees, as the freedom’s initial condition, to be exempt from this process of life and death struggle. According to leftist view, freedom can only start with civilization’s domination over Nature and inside the complex human society. Because only then, according to leftism, an individual will be able to develop the civilized qualities that will make freedom possible.

progress of technical advancements: serfdom was an obstacle in front of the creation of urban proletariat which will work in modern factories; and guild system was blocking the application of new production methods with its constraining rules. The shattering of these old economic relations increased the dynamism of economic activity, freed the serfs from the forced labour relations and opened the way to the creation of the working class of the industrial societies, and the implementation of the new technological developments to the production. Material abundance was closely connected to the freedom of enterprise and trade. In order for these two to flourish, it was necessary that people consumed more, and thus it was necessary that they were free consumers.¹⁷

First wave leftists also emphasized the freedom as related to the faith. Because the newly formed industrial society was relying on the scientific method in order to conduct/develop its activities and the scientific method was much more efficient in solving technological immediate problems,¹⁸ creating new powerful means which were being implemented in all sorts of domains from production to transportation, to communication. And thus scientific method brought with it the end of the hegemony of the religious world-view. Religion had to be relegated and confined to the individual's own private life. This confinement of religion also cleared the political and public life from the religious strife that exhausted society's energy for long centuries.

In short, the changing structure of the society due to the industrial revolution required adopting "equality" and "freedom", and solidarity with the whole social system, rejecting superstition and accepting the guidance of science as social values, and the left played a leading role in the conceptualization and acceptance of these values in that period.

Ideas that were advocated initially by the bourgeois left, and later by the socialist leftists as well (the elimination of class-based privileges in society, the equal acceptance of people before the law, etc.), became dominant values in North America and Western Europe and settled as legal institutions as of the half of the 19[th] century. Monarchies and other inherited power positions (upper legislative chambers or judicial courts with hereditary memberships) were mostly reduced to symbolic entities. With the equality before law, the abolition of the privileges, the disappearance of small communities (such as artisans' guilds, large families and tribal groups) in the society, the individual was left alone and isolated in front of the large social collective. All these developments left

¹⁷ But of course the real implications of this consumerist freedom showed themselves later, when technology greatly increased the production capacity and flooded the society with all sorts of goods, commodities, services and gadgets.

¹⁸ Scientific methods are effective in solving immediate, short term effects of technological problems but the new methods and technologies implemented to solve these problems generally produce even greater problems in the middle and the long term. For example, petrochemistry was an effective method for devising cheap, new, easily shaped numerous materials; but today, plastics are a big problem of pollution and a serious danger to health due to the endocrine disruptive effects of microplastics and toxic chemicals which are leaching out from plastics. Nearly all living beings in the world today have these toxic chemicals in their bodies. Chemists who created these techniques in the last century couldn't have imagined that plastics would have those enormous side effects.

only the states as the hegemonic organised entities, representing the collective power of the whole society. The advancements in transportation and communication facilities, which went in tandem with the development of technology, provided the state with the opportunity to enforce its laws more broadly and to better monitor and control its citizens. It tracked its citizens' incomes and expenses, recorded them since their birth, and recruited them as soldiers. The concepts of the modern system of near-universal national conscription, compulsory education, and the rights and duties of citizens to the state and of the state to the citizens emerged. Under these circumstances, freedom just meant doing what the social collective allowed.

Second wave leftism: The socialist left

In Western Europe as of the mid-19[th] century, the values that only leftist progressives advocated previously (equality before the law, freedom of religion and secularism, abolition of slavery, representative democracy) have been accepted by almost every segment of the political spectrum.¹⁹ Once the values of the first wave left were settled in the society and became the basic values adopted by virtually every segment of the social system, the socialist left came into play. Socialist left started to take as its target the social security and the economic equality of the masses. The goal of the socialist left became to demolish the market order that had left people in precarious living conditions, and to establish a new social order in which material abundance would be achieved, and thus “real” equality and freedom, in the sense defined by the socialist left, would be established. According to the socialist left, equality couldn't be defined only as limited to equality before the law and the abolition of the hereditary privileges. Society ought to ensure that everybody should have equality also in terms of material abundance. Every citizen should have as a basic right to enjoy the material commodities and services produced by the industrial revolution's new technological advancements. And this notion of “equality” is closely related to the notion of “freedom” as understood by the socialist left. According to this view, only beyond a certain threshold of material abundance a person can be “free.” Otherwise he would be forced only to struggle to satisfy his physical needs and wouldn't have the opportunities to cultivate the civilized capacities that, according to leftists, would make him “free.” He wouldn't be able to cultivate artistic capacities and enjoy or produce artistic works for example. Or wouldn't be able to immerse in political activities or enjoy the freedom of expressing himself or wouldn't have the ability to follow his fellow citizens' ideas.

¹⁹ To a great extent this also had happened in North America. There was an agricultural regime in the south of the United States which was still using slave labour, but it was becoming more and more of an archaic structure with the advent of the industrial mode of production; and finally, the use of slave labor was abolished during the second half of the 19th century there. In other respects (freedom of religion and secularism, freedom of expression, equality before the law for the citizens, representative democracy, etc.) the United States had already been founded on the principles of first wave left by people who deeply internalized those values or even contributed to the formation of them.

Thus, according to socialism, in order to “real” equality and freedom to be possible, a certain material abundance should be ensured by the society for everybody.

Since traditional small communities, where people found the possibilities of interpersonal solidarity, had been dispersed, the individual was left alone in the crowd. For this reason, the view that the large-scale society should protect the individual had started to be dominant in the society and the left had played a leading role in defending this view and making arrangements for it. Individuals, isolated in the crowd, could no longer trust and turn to each other, to their closest relatives or friends, in order to assure their subsistence, but to mechanisms such as insurance and retirement provided by the system. So solidarity was collectivized. In fact, the isolation of the individual vis-à-vis the large social collective was a deficiency resulting from the breaking of the old bonds, which then was seen to be compensated for. The masses, which had been pushed into an atmosphere of great uncertainty and insecurity, were thus secured by and integrated into the system. Social life was thus protected from the environment of turmoil caused by this uncertainty and precariousness.

In Europe and North America, the historical role that the socialist left performed since the half of the nineteenth century was to adapt the social segments formed by the new production methods that emerged with the industrial revolution (the working class) to the social structure, as a perfectly functioning component of the system. With the industrial revolution, a new form of production relations emerged as the old social structures formed around agriculture disappeared and the masses flowed to the big cities as industrial workers. But this newly formed class lacked the old forms of social solidarity that provided social protection and stability for the individuals. The peasantry made it possible for people to rely on their own labour and power in terms of the production of nutrients that were essential for their physical survival. The peasants were not completely connected to the larger social system outside their communities and were able to meet their basic needs with their own strength to a certain extent. The villagers, leaving the subsistence economy of their villages flooded to the cities as workers and became completely dependent on the system for their physical needs. They needed food products, housing, clothes, shoes, etc. produced by others to survive. This meant that if they could not find a job, it directly resulted in hunger and misery. Technological developments were the main reason for the villagers to flock to the cities as workers. Mechanization in agriculture reduced the amount of people needed for agricultural labour. The fact that these people went to the cities as workers was breaking the fabric of the old society and created a mass that was constantly standing on the edge of society and prone to defy the rules and threaten the established order. Mechanisms were needed to keep the cohesion of this newly formed social structure, because the precarious life of these newly emerging working classes at the beginning of the industrial revolution made the system inefficient and posed a great threat to it.

Socialists of the Western European left made the system more efficient by making institutional arrangements to integrate the newly formed working classes into the system as a result of their struggle based on the principle of eliminating capitalism.

The welfare state, and the practices that redistributed the wealth through the society which emerged thanks to their struggle, strengthened the system by instituting the social peace and creating an increased demand for consumer goods. They basically relied on two tools in adopting these reforms, which allowed the system to correct itself. The first of these was the wage-working masses, which formed socialism's own bases and were brought about by the industrial revolution. These working classes, organized in trade unions, created a pressure group in the first years, and ensured reforms when the socialist leftists could not take over the government. The second tool used by the left was the state organization itself. To the extent that socialist leftists grew in number and captured the state apparatus, they made these reforms themselves, using its law-making power.

The same institutional arrangements were also implemented in the United States with the pressure of the Great Depression. There were also in the United States leftist parties (socialist and communist) and workers' organizations, and these were especially active until the Second World War. And there was also a progressive movement which had very similar social views to the social-democratic European left. They were defending similar ideas, values, and judicial and institutional reforms to those defended by European second wave leftists. But they weren't very effective instituting a welfare state until the Great Depression of the 1930s because of the special characteristics of the United States. In the United States, compared to Western Europe, people and local communities had relatively better material conditions compared to European masses thanks to the country's vast expanse and its rich and unexploited natural resources; and thus people had more independence vis-à-vis the central state. These conditions created individualistic tendencies and ideas which gave importance to self-reliance, local independence, etc. And American society (in its initial establishment) was greatly composed by immigrants escaping from their governments; this situation created an atmosphere of suspicion with respect to central state structures and their intervention in local autonomy. But all this changed with the rapid industrialization of the United States after the second half of the 19[th] century. This industrialization created a mass of urban working class people who had no material securities (just like the working masses in Europe) and were totally dependent on large organizations for their sustenance. The Great Depression unequivocally made evident the dangers these precarious conditions of the masses posed to the system. Thus, the necessity of the arrangements advocated by the American left became apparent. New Deal reforms (which, among other things, included also the social security measures of welfare state practices: pension rights, minimum wage, work-hour limitations, social security schemes, legalization of trade union rights, etc.) institutionalized the collective insurance mechanisms for the masses who had no material securities apart from their salaried jobs. By ensuring the state's intervention in the economy in order to accelerate the economic activity and increase the consumption capacities of the masses with the new social reforms, progressive New Deal reforms helped the United States surmount the Great Depression and stabilize the techno-industrial system there.

A highly collectivist mass society

Since the late nineteenth century through the first part of the twentieth century when these reforms have been carried out, basically no difference remained between the policies proposed by the socialist leftists and the rest of the political groups of society. Because what had to be done basically to ensure social cohesion and stability had become a reality accepted by all wings of the political spectrum. In other words, the struggle of the second wave leftists to supersede the system ended up showing it where its own interests were. Practical reforms such as the expansion of democracy (recognition of the general right to vote, removal of the powers of monarchist residues or reduction of them to a mere symbolic status), the establishment of the welfare state, and the regulation of the working day and conditions by law, became policies advocated by almost every segment of the political spectrum and thus were performed. Because, the necessity for the establishment of a mass society and the value of democracy emanating from this necessity created a situation in which no one could advocate keeping the crowded working class on the borders of society any more. These masses of workers had to be integrated into the system. Reform policies were adopted by all political segments. The universal suffrage made the state more sensitive to reform demands, regardless of who was in power, and it became the engine for the realization of reform demands. These reforms also strengthened the technoindustrial society, allowing it to fully settle. Leftists' efficiency in reforming the system rendered their ultimate goals of overcoming capitalism meaningless in advanced industrial parts of the world (Western Europe and North America).²⁰ Thanks to these reforms, to the enormous increase of the production capacity through the technological developments, and to the redistribution of this wealth through the welfare state practices, the system was transformed, and the material prosperity, which the socialist leftists originally believed to be possible only under a socialist economy, became a reality in capitalist economies too.

The societies that emerged together with the industrial system were mass societies with collective needs, and the best way to ensure stability in these societies was to give these masses the appearance of participating in the management of these societies through the institutional arrangements called democracy. To the extent that the functioning of the society required a very crowded mass of people, who became more and more tied to each other to work together, the creation of a feeling that they were also

²⁰ In Tsarist Russia, a very narrow clique conquered the administration of the society by the combination of very special conditions (World War I; the land demands of the peasants, who make up the majority of the society; a non-inclusive and rigid political structure that cannot integrate workers and peasants into society; etc.) and they called it a socialist revolution. They wanted to manage the economy in a planned manner, by ending the market's impact. This experience, an economic system that is managed by a single actor (the state) and based on a central plan, proved to be less successful than the capitalist economic system (which is not a drawn and defined economic system with precise boundaries; in the most general sense, "capitalism" means that the economy is not managed by a single actor, from a single center).

involved in the administration became a necessity. This highly collectivistic character acquired by the society made it necessary to develop modern, anti-individualistic values and ideologies. Along with parliaments and executive organs formed by elected members, employers' organizations and trade unions and various non-governmental organizations constituted the cooperation and solidarity mechanisms of the new mass society. The establishment of the multicultural ideology that made it possible for different segments (religious, ethnic, etc.) of society to participate in the social activity was also due to this need. A new solidarity-based social order was built after the Second World War across the industrialized countries of the world. This order of social solidarity was a social necessity during a period when the system needed the power of human labour intensely.

After the Second World War, universal voting right (including women), right to referendum, independent judiciary, separation of religion and state affairs, parliamentary control over foreign policy, freedom of association and opinion, elimination of discriminatory laws against women, free health services, free education, gradual income tax and property tax, regulation of working days and conditions, labour insurance, pension rights, etc. were largely realized in the industrialized countries of the Western Europe and North America. At the end of the war, socialist or social-democratic parties were in power in most Western European countries. However, they were no longer outside the system and trying to overthrow it (in the sense of establishing a different economic and political order), but instead, they aimed to manage the system and tried to prove their talent as managers to the masses and other established institutions. The establishment of universal suffrage entailed the mainstreaming of political parties. Under these circumstances, the parties were in a state to become either mainstream or marginalized. Of course, leftism had been already focused on the improvement and development of the techno-industrial system from the very beginning. However, in the post-war years, the socialist and communist parties completely abandoned even the goal of transforming the economic system in a revolutionary way (seizing the administration in a violent manner and changing the economic system through forced methods)²¹. Their main goal now was to enable the existing social system to evolve to a fairer point and to make extreme inequalities disappear. And to grant everyone basic social rights such as the rights to work, to a minimum wage, to health and to education. These were precisely the developments that reduced tensions within the system. Improving socio-economic conditions and increasing equality in this sense could only be achieved under stable

²¹ After the student upheavals of 1968 subsided, a very small number of people who were active in student and youth movements had recourse to terrorist acts during the 1970s. Their aim was (if these terrorist acts weren't a mere reaction to their psychology of powerlessness and they ever rationally position these acts on a strategic plan) to disrupt the established harmony of society and open again a way to violent confrontation in order to supersede capitalism violently as in the 1917 Bolshevik version. But their recourse to physical violence was a suicide for them. They could neither get any support from the masses whom they claim to represent and bolster into action nor push other mainstream parties to more radical positions.

economic growth and the material welfare provided by it. Since the technological development was the most important factor that would increase these welfare conditions and material abundance, the suitable conditions for the technological development should be met also. In sum: They strove for a social system which reduced its internal tensions and could allocate the necessary resources to scientific and technological research.

The result was a society where people's purchasing power increased, where they could choose ever more commodities from the most varied products offered to them, and where they tried desperately, but unsuccessfully, to make their lives meaningful with this consumption. Since the system's collectivistic pressure and control was by then so huge on its members and prevented them living according with their natural tendencies, an exhaust valve was necessary to ease the accumulated pressures. This role started to be played in this easy, materially abundant "consumer society" by the offers of different entertainments, hobbies, commodities and services. But in this "brave new world," the initiatives were completely taken away from people's lives, and individuals were diluted in a huge collective shaped by the ideology of equality. A large social organization that functioned like a machine, and a mass of isolated people confined to roles defined by the social system. The necessities for their survival were provided to them by the social system without a physically and intellectually stimulating effort directly related to these needs on their part, on the condition that they remained a functioning cog in the social machine. By obeying the roles given to them by the system, they could guarantee their own existence and choose from the consumption options offered to them.

But such an existence took away from the people the ability to satisfy a biologically based human need: The power process. As defined by Kaczynski in *Industrial Society and Its Future*, "the power process" signifies the natural human need to conduct activities more or less autonomously using one's physical and intellectual capabilities. By going adequately through this power process, people can satisfy themselves and be content with themselves and their lives. The satisfaction of the need to go through the power process is directly proportional to the importance that the goals pursued have for one, to the effort needed to achieve them, to the degree of success in achieving them and to the autonomy one has in pursuing them. In short, people need to have important goals and need to reach successfully to some of these goals using their own capabilities autonomously. So, given that the physical and psychological necessities which keep us alive and improve our reproductive fitness are usually the most important things for us, satisfying these needs through our own effort and on our own initiative is the ideal way of going through the power process. But generally, the prevailing living conditions in the technoindustrial system don't allow many people to achieve some important goals no matter how much effort they make. Or they allow people to achieve some other important goals with too little effort. Or, in many other cases, the goals that the system lets people to pursue with some effort are not important enough to adequately satisfy the power process. Or it doesn't allow them to pursue their goals autonomously enough. In any of these cases, the need to go through the power process is not properly

satisfied or not satisfied at all. The destruction of the possibilities to live healthily the power process creates psychological problems in people (depression, feelings of inferiority, eating and sleeping disorders, etc.) These problems are tried to be avoided or compensated with surrogate activities which serve as incomplete replacements for the life- and-death activities of the natural power process. But these surrogate activities (hobbies, entertainments, pastimes, etc.) usually aren't effective enough to completely satisfy the need to go through the power process. Neither usually are satisfactory the rest of activities that people have to realize in the techno-industrial system, like their jobs. Often, these activities are not actually important enough for those who carry them out, they are too easily carried out, or they don't allow enough autonomy those who realize them. In the techno-industrial society, the necessities of the physical existence are frequently offered to the members of this society without the need of a serious exertion on their part. Even in the case of heavy and physically demanding surrogate activities or jobs, the nature of most of these activities is such that they don't satisfy adequately people's need of engaging in stimulating activities. Usually, jobs don't challenge the workers' capabilities and don't allow their autonomy. Too often, people perform their duties as mere automatons in the great machine of the economic activity. Even if some people are able to pursue and attain some important goals through a relatively interesting and intense effort-demanding job, the lack of autonomy too often greatly hinders the efficiency of those activities as ways to go properly enough through the power process. But generally, the goals that the system lets people to pursue in their jobs are not even important enough to adequately satisfy the power process.

After the Second World War, consumption became one of the principal activities that have been used to compensate the lack of opportunities of adequately going through the power process. Because, after the Second World War, technological development reached to a point where it was possible to continuously flood the society with all sorts of commodities, gadgets and services. Thus, people had become addicted to more consumption, and their commitment to consumption made them more in need of the system, and further strengthened it. The only power left to people was virtually the power to choose what they wanted to consume. What this society called freedom consisted mainly of being able to "freely" choose the consumption possibilities offered by the system. This consumption mechanism built by Western societies created the best environment in which the techno-industrial system could develop, because it made possible to partly ease the psychological unrest produced by the impossibility of going adequately through the power process. The system also used consumption possibilities as a carrot and stick for the voluntary participation in the social system without the need for deliberate forcing. The masses that were taken away from the power process could to a certain extent ease their psychological discomfort with the "free" lifestyle offered by the consumer society, and this feeling of false satisfaction made them voluntarily spin the waterwheel of the system. This is exactly the point where the socialist systems failed. Because they could not build a consumer society, they could not get the approval of the people, and the masses could not be ensured to join the wheels of

the system on their own accord. Forcing people to do something has always had worse results than making them do it willingly. Socialist systems were not able to ensure the voluntary participation of their masses as strongly as western societies; despite coercive interventions to control people's daily lives, thoughts and behaviour, socialist countries could not control their members as deeply as Western societies did it without using physical pressure from above.

The success of capitalism in raising social welfare had refuted the old socialist thesis that capitalism would never ensure the welfare of the masses and that working classes would become poorer in this economic system. In practice, Western European socialist parties began to abandon socialism as the goal to be achieved. It turned out that the complete abolition of private property was not essential to social equality, prosperity and happiness, which were the ultimate socialist goals and reasons to abolish private property. Moreover, the transformation of private property, the gradual transformation of companies into joint-stock companies, and their transformation into organizations owned by shareholders and managed by bureaucracies, not by individual bosses, made socialist conceptions of statism and of the economy governed by the state meaningless. Production methods used in factories were imposed by technological development, and nationalization would not change them qualitatively. Technology had an independent determinism beyond ideologies. Thus, socialist left parties, abandoning the Marxist class war and the overcoming of capitalism through the abolition of private property, focused on the acceptance and implementation of the ethical values emanating from Christianity and humanism (the protection of the oppressed, affirmative action, furthering of the social equality through the welfare state, increasing the social cooperation and emphasizing the individual's duties to the society and society's duties to the individual and their complete amalgamation) in the framework of the current economic order. Because it turned out that the development of capitalism would not necessarily result in increased inequality. Capitalism could be directed by state intervention to achieve the desired results. A high-wage capitalism, where equality of opportunity was ensured and the relentless race pursuing property was controlled by the state, which guaranteed the consumption of the masses, would enable a society with leftist values and goals thanks to the abundance created by the technological development. The way to achieve them depended on achieving economic growth through social stability and technological development.

Although socialist leftists had came out of the classical framework of what their theory said about the capitalist system, they continued to believe in progress. As I have already mentioned above, the concept of progress forms the basis of leftism, and without faith in the concept of progress, there is no leftism. According to this new leftist understanding, progress was also possible within the framework of capitalism, and over time, this would be approached towards the desired society, as progress took place. In sum, the European socialist leftists' persuasion that capitalism will create

wealth led them to focus on sharing the wealth capitalism produces rather than on destroying capitalism.²²

In the middle of the 20[th] century, there emerged a belief that ideologies had disappeared. In fact, this was a feeling resulting from the dominance of techno-industrial civilization and its values. A social system where society would function like a perfect machine thanks to the developments that would be brought about by the blend of science and technology, in which people would live in a greater material abundance and could choose the products they wanted from the varied consumption goods, could be the only ideal that humanity would pursue regardless of economic systems. The idea of progress of the radical philosophers of the Enlightenment had become the main motto of all societies, from China to America.

The third wave leftism

As the old issues (the elimination of misery and brutal exploitation, the regulation of working time and conditions, the right to education, universal suffrage, etc.) were gradually resolved, leftists started now focusing on other issues.²³ Leaving aside its project of changing or reforming the economic system, the left, starting in the sixties,

²² The first Marxists did not believe that capitalism could grow forever. This was one fundamental aspect of their criticism of capitalism. According to this view, capitalism was an obstacle to growth due to its internal contradictions, because it undermined technological development, preventing society from taking full advantage of it, and capitalism would eventually collapse because of the growth of these contradictions. Compare this with the fact that one of the main complaints of today's leftists towards capitalism is its unlimited growth trend. Of course, in order for this complaint to emerge, today's understanding that the activities of the techno-industrial system are causing disturbances in the biosphere that threaten the very existence of this system, should also emerge. Current left's "green" opposition regarding the unsustainability is helping the system to correct itself in this area as well.

²³ The fact that the values that once were advocated only by the left and the people who were deemed radicals in the society gradually have become the mainstream values of this very society over time shows us the mechanism of the change of social values in the past two hundred years. The people who first seem radical begin to advocate the adoption of values that will be necessary for the realization of the social consequences of technological development, over time these become the values that a larger minority advocates and the left creates an atmosphere favorable to them by developing the methods of applying them and convincing the masses of the "goodness" and "fairness" of these values. These values eventually turn into an agenda that everybody who wants to manage society feels pressure to assume, promote and apply and thus the society flows towards a point where it can adapt better to the changes brought by technology. One of the concrete examples of this is the adoption of the concept of democracy (the abolition of the power of the monarchy, parliamentarism and the debate revolving around universal suffrage) as a value accepted by all segments of society. Democracy at the end of the eighteenth century and at the beginning of the nineteenth century was not a value advocated by all political segments. Democracy was a controversial concept advocated only by the leftist radicals. But by the middle of the 20[th] century, at least in North America and most European countries, it had become a value that every segment of the political spectrum advocated and everyone accused each other of being not democratic enough. And since then, this democratic mindset has only expanded throughout the world. In other words, leftist values became increasingly the mainstream values of modern society.

began to address the issue of identities (gays, women, all sorts of minority groups, animals, etc.) and their oppression. So the main goal of the left from then on started to become the increasing of social “equality” (in the sense that different identities and minority groups deserve equal conditions). The scope of this goal, which was defined by the first wave left as the equality before law and later by the second wave left as the equal prosperous socio-economic conditions for every segment of the society, expanded over the years. This greatly entailed enlarging the categories of the oppressed. “Oppressed” was no more a mere category of low socio-economic status. The widening of the scope of the “oppressed” led the left to directly meddle in the people’s private lives, beliefs and behaviour. In fact, it can be said that the project that the left put forward after these years was a project that went much deeper, penetrated the capillaries of the society, and tried to regulate everything from people’s thoughts to everyday behaviour. Citizenship rights; social rights of minorities; personal freedoms; women rights; animal rights; the normalization of those sexual tendencies that the traditional society had seen as heresy until that time; the abolition of abortion bans; the loosening of the traditional values and the removal of censorship in cultural products such as movies, books, music, etc.²⁴ in short, nearly every aspect of everyday life was politicized and began to fall under the regulation of the leftist ethics.

Two major strikes occurred across Western Europe, through the sixties. While these waves of strikes reintroduced the hope that the capitalist system could be overcome by some Bolshevik methods to some marginal leftist groups,²⁵ it was actually an indication of how much the working masses had been pacified by the carrots and sticks of the system and how they wanted to take advantage of the system more than eliminating it or just demonstrating their hostility to it. These strikes and the way they were terminated (through the channels of dialogue between different segments of society, like the unions used to negotiate with the political establishment) were an expression of the success achieved in integrating large masses into the system. The workers’ expectations for these strikes consisted from the beginning of just making some material gains.

Along with these strikes in the sixties, also occurred some revolts that began almost simultaneously around the world, known as the student and youth movement. The emergence of students and youth as a political force became a possibility, throughout the twentieth century, with the spread of higher education, the increase in the number of students in the society, and the subsequent stretching of the period between adolescence and adulthood. And the global character of this youth movement, which started to appear on the whole world more or less at the same time, was made possible by the mass society created by technological development. With the development of communication tools, students in Europe were able to instantly learn about the demands and challenges of students in America. They all read the same books, watched the

²⁴ But of course, their pathological insistence on political correctness has created an equal if not more deep and intense censorship.

²⁵ See footnote 21.

same movies and listened to the same music. The development of the education system and the welfare society led to the dissemination of ideas and cultural and material possibilities, which previously were once accessible only to small minorities, throughout large masses of students by means of educational and cultural opportunities. The economic welfare situation of the sixties caused these students to have confidence in their material conditions, so they could deal with more general issues. They started to have some grandiose ideas about their importance, that their life should be more than mere working and having a family. Since they thought they became so “cultivated” by graduating from a university and consuming the cultural commodities of the techno-industrial society, they felt that they need to have importance and a big impact on society. But as the number of diplomas increased, their relative value was depreciating enormously compared to previous years. Society wasn’t able to offer high career positions to every university graduate. In parallel to that, possibilities of going through the power process greatly diminished in those years and this fact was creating psychological problems and dissatisfaction in many people. They were living these seemingly contradictory feelings simultaneously. On the one hand, there were feelings of inferiority and powerlessness due to the impossibility of going through the power process and the abyss between their expectations and what society had to offer. And on the other hand, there were feelings of self-importance and of themselves being out of ordinary due to their “high” education and “qualifications.” This sense of being over-qualified for the roles society offered to them was increasing the acuteness of the feelings of inferiority and powerlessness they had. But they attributed the roots of these feelings to wrong causes: capitalism, commodification, lack of political power. This youth movement was actually an expression of the problems of the techno-industrial society, rather than being a movement contrary to such society which advocated values against it; what this movement wanted was just to take advantage of this society’s “blessings” without being exposed to its restrictions and its inevitable negative consequences.

The values of the student and youth movement born in the sixties were as follows: rejection of traditional values from the past (values related to the traditional family and sexuality, etc.), opposition to discipline and hierarchy, contempt for work, a hedonism that emphasizes the moment, continuous entertainment against boredom, sexual freedom, LGBT rights, full integration of women in modern society, opposition to traditional male roles, rejection of violence, objection to what they called the strict norms of the scientific method, the belief that there is no single, permanent and precise truth

and objectivity -also called relativism-,²⁶ etc. There are two main reasons why these values exploded with the student and youth movement in the sixties:

- The first is the complete elimination of traditional agricultural societies by the technoindustrial system in Western Europe and North America, and therefore the utter replacement of the residual value leftovers from the previous form of society with new values, by this time. The autonomy of small scale communities (like families or village/town local communities) had been utterly destroyed by then, and people were completely connected to the techno-industrial system rather than to small scale traditional communities.

- The second is the psychological disturbances and unnatural behavioural tendencies created by the lifestyle of techno-industrial system because, by this time, it had become impossible in the industrialized countries of the world to adequately go through the power process.

To give a concrete example of the first reason: The completion of the elimination of the traditional agricultural societies in Western Europe and North America meant also the culmination of the full integration of women to techno-industrial system. This process began during the industrial revolution with the economic integration of women to the industrial system and was more or less completed during the last half of the 20[th] century at political and intellectual levels too. Disintegration of the subsistence home economies eliminated the traditional economic role of women and children in the pre-industrial family. Women, beginning from the 19[th] century, started to join ever more domains of industrial system's functions, and children needed to go through an ever longer process of education in order to get a job in this system. These changes brought deep alterations to the traditional family structures and the roles individuals assumed in those structures. For example, the fact that children needed to spend ever longer times for education in order to get a job increased the cost of raising children, so families started to have fewer children,²⁷ and this was one factor in the relaxation of

²⁶ After the position of religion as the dominant ideology in society was destroyed in Western societies, some of the leftists who had the most intense inferiority feelings began to criticize science, which they saw as the dominant ideology, because science, According to them, established certain categories, and this could mean that some people and cultures were inferior and bad. These criticisms started to appear too in most leftist environments in developing countries, such as Turkey, but there still prevailed the old leftist mentality that science breaks down superstitions and enlightens people and thus plays a dominant role in the creation of a prosperous and happier society.

²⁷ In traditional subsistence home economies, children assumed economically beneficial roles (like herding or milking livestock animals, sowing fields, helping in household chores, etc.) from a very young age. In modern industrial societies, these roles of children have been totally eliminated, and besides new costs have had to be assumed by their parents. They need to go through a long education process until a very late age and the investments (school fees, clothes, school equipment, textbooks, and now electronic gadgets they need or want, etc.) made on them during this process are very high and getting higher. Thus, they contribute nothing to the family economy; on the contrary, they are a large financial liability on it. For this reason -among others, like because now they are able to control reproduction with modern contraception methods- people are having less and less children in modern industrial societies.

the family ties. Third wave leftists' rejection of traditional family roles and sexuality was the reflection of these changes on the societal tendencies.

Related to the second reason: The complexity of the society in terms of the development of technology and the fact that people became small gears of a large collective eliminated the possibilities of going adequately through the power process. People had become entirely connected to the social machine for their physical existence, and many had become more lazy and insecure, and they feel inferior, as they did not have the means to use autonomously their own abilities and powers to carry out life-and-death tasks. They did not want to accept competition because they did not trust themselves. They despised the family structure because they wanted to enjoy the pleasures of a sexual life without the responsibility of the family. They wanted to enjoy all the pleasures and tastes, living the present, without thoughts about the future. They wanted all kinds of hierarchies to disappear for they did not trust themselves, because they were sure that they would be low down in the hierarchy due to the inferiority they felt. They refused things that demanded endurance, work and perseverance because they felt that they do not have the ability to do them. After the Second World War, the society established in Western Europe and North America has been able to gradually present to their members very easy, comfortable life conditions. Material restrictions have been greatly abolished; working conditions ameliorated; living quarters, with all the air conditioning/heating and ergonomic technologies have become totally regulated and manipulated for the human convenience.²⁸ The society has been taking care of the needs of their members with only a minimum exertion on their parts. This lifestyle eliminates the goals that are really important through the elimination of the necessity to exert oneself to achieve them. The result of this situation is boredom. And many have tried to alleviate boredom with pleasure and immersing themselves in hedonism. For this reason, the philosophy of living the moment is very pleasing to the masses trapped in this kind of life. To live the moment, to give oneself to physical pleasures, to go beyond the hierarchies is in fact well suited to the understanding of life offered by the consumer society. They represent a countermeasure paradise against the meaningless and dissatisfaction laden, boring modern everyday life.

During the sixties, leftist thinkers who were pursuing to attract young people and to express their feelings were developing a theory that criticized everyday life beyond economic misery. The concept that came to the fore was alienation. With this notion they were criticizing the fact that human relations became commodity relationships, i.e., the regulation of an entire life, including work and leisure, was being conducted in the framework of the exchange of products and services, and thus life was being

²⁸ There has been a considerable progress in the regulation of the immediate environment for the human convenience (control of heat, ergonomic design of everyday objects, delegating the tasks that require physical effort to machines, etc.) But this doesn't change the fact that humans are living in artificial environments which are not suitable to their natural tendencies (and crowding, traffic, air pollution, noise, lack of open natural landscapes, etc. continue to be problems too). These regulations are actually the palliatives for the fact that humans have to live away from their natural habitats.

reduced to technically designed periods of time to expand the production of commodities. But, paradoxically, they found the way to get rid of this cycle in the further advancement of technology and the disappearance of the concept of work. Because, despite criticizing the lifestyle brought about by the technological society, they didn't see the real reasons and causes that had made this lifestyle a reality. They only saw the problem in capitalism and the fact that this lifestyle demands money in order to offer its commodities. These leftist theorists and their followers in the youth movement had internalized the values of the technoindustrial society. They wanted to live the hedonist lifestyle offered by the consumer society without the necessity of earning and spending money and without the boredom and meaninglessness this lifestyle implied. So they saw the solution in the abolition of capitalism and money relations. Thus, they saw the final emancipation in an endless fun where people would be freed totally from work, hardships and struggles. The lifestyle they suggested consisted of the consumption society they criticized, free from its "bad" aspects (work, responsibility, family, hierarchies, traditional moral norms, etc.) and taken to its ultimate logical consequences.

The student and youth movement of the sixties caused the birth of an extreme identification with feminism, environmentalism and "the oppressed" (women, as well as the races different from the white race, people with beliefs different from Christianity, people with different sexual orientations, animals, and so on), and so the foundations of today's leftist movement (third wave left as I have called them) were laid. The third wave left, which owes its ideological origins to the Frankfurt School, post-modernism, structuralism, existentialism, situationism and counterculture, has focused on the issues of the "oppressed" and it has increasingly strove to regulate private spaces. Now the left has ceased to be a struggle of the working class. It has gained a much wider cultural and social meaning, and has begun to take all the values of society into determination and shaping. According to third wave leftists: relationships between men and women should be regulated by feminist ideology and women should aspire to its ideals, the words that we utter should conform to political correctness, parents should be progressive and responsible, teachers should be inclusive and supportive, everybody should watch his microaggressions and unconscious racial bias, etc. Gay marriages, abortion, rape and harassment, distribution of salaries and employment on the basis of identities, hierarchical organizations, competitive society, food preferences (veganism), women's quotas, child care, family roles, attitudes towards animals, gender roles, etc. have become the most fiercely discussed political issues. Thus, personal issues and the private life and behaviour of each individual have been politicized and have become areas subject to regulation by leftist ethics. The society has become a place in which people are ever more controlled and socialized with the new problems that leftists continuously find and the gradual increase of social norms (explicitly or tacitly stated) telling people how they should behave regarding these matters. People have ended up living increasingly surrounded by politically correct norms that tell them how to be-

have in every aspect of their lives. This has socialized people even more and has made the tendency to comply with norms more internalized, creating a docile citizenship.

So, in essence, the historical evolution of leftism can be summarized as follows: The first wave left, which emerged with the movement of the Enlightenment in the 18th century, defended freedom of thought, the domination of science and reason in the organization of society, and the rejection of innate privileges. After the realization of those goals, the second wave left concentrated on social rights, social and economic reforms that would emerge in industrialized societies and enabled the broad masses to be integrated into the system, leaving the subsistence economy and working in the production, and later in the service sectors. After the complete realization of these in the developed industrial countries as of the sixties of the last century, the third wave left, with the student and youth movements that started at the same time, focused on many micro-issues that would regulate people's behaviours and daily lives, and would impose on people social norms that made them become a docile component of the system.

An example: Feminism

The path that the feminist movement has followed since its beginning in the end of the eighteenth century is an example of the evolution I have mentioned above for the left generally, which has gradually become deeper than the mere legal rules and has started to shape social norms and the behaviour of the people. The first wave feminist movement²⁹ initially advocated giving women the right to vote, legal rights for married women, and better education, job opportunities, unionization and family benefits for women. In other words, their aim was to extend to women the rights given to men during the reforms of the first wave left. The focus of the first wave feminist movement during the end of the 19th and first half of the 20th century was generally related to the granting of women's citizenship and political rights, like being able to vote in elections and taking part in public positions. Then, since the sixties of the 20th century, second wave feminism started to focus on social and private life issues. According to the second wave feminism, the fact that women had equal rights in the political life was not sufficient for the establishment of true equality, because inequality was built from outside the public life, from private life, from family life, and women were regarded here as second-class citizens, and therefore deprived of the possibilities of exercising their public rights. According to these feminists, society taught women a specific role of femininity in their private lives since birth. This female role prevented them from taking their place in social life as full equals to men. They could not participate in political life and economic life as men's equals. Thus, the issue

²⁹ In this section on feminism, I am using the classification of feminists themselves. According to that classification, the first wave of feminism was from its beginning in the late 18th century to the 1960s, and the second wave of feminism was from the 1960s to the 1990s.

of women's rights was no longer a legal issue, but a social issue and an issue that required regulation by social norms.

In the socialist tradition from the late nineteenth century (along with Engels and Bebel), there has been a tendency to see the family as the institution where social exploitation had started, where it manifested itself on a smaller scale and where exploitation based societies were originated in general.³⁰ Accordingly, the family is a small copy of the exploitation system at social scale, and general human enslavement begins with the enslavement of the woman in the family. Thus, an understanding was born in which social progress was measured by the level of women in society. The desired utopian society wouldn't be reached unless women's liberation would be reached too. General liberation and liberation of women were closely linked. Economic and technological development would bring social liberation and women's liberation. For the feminists, the world of work was where women could gain freedom. By entering the economic life, they could get out of traditional family roles and earn their own money, like men. Because men made their voices heard with their place in the economic life and their organizations (unions, etc.) shaped around the working life, and so they became a power in the society. Women could also gain their rights by participating in this aspect of life. When we look at the process that took place during the twentieth century from today, we see that the result of all this is that women entered economic life and presented their talents for the benefit of the system. Half of the population of the society was thus better integrated into the system. In the newly established technological society, women took their place in the construction and maintenance of the social system, and this system took advantage of it. But in order for this to happen, a certain technological development had to already penetrate society: With the development of machinery, the subsequent loss of the necessity of a great part of the work based on muscle strength, and the development of the service sector, office and white collar jobs, new employment opportunities for women emerged. Women generally participated in employment by taking part in these jobs in large numbers. Simultaneously, the emergence of electric household appliances significantly reduced the burden of housework and created the possibility for many women to enter the working life.

³⁰ Then Simone de Beauvoir would say that femininity is not an innate feature but it is socially built. This is a reflection of the view that humans are a blank slate and do not have a number of behavioral, intellectual and physiological characteristics that are innate and determined by genetics. And this notion started to constitute the basis of the second wave feminism. Using this trick, it became possible to claim that all the things associated with femininity (and masculinity) are a construct of society in order to shape and exploit women according to the needs of the "patriarchy." But in fact, this notion of gender as a social construct makes it easier to justify any further attempt to adjust women (and men) to the requirements of the modern techno-industrial society by means of feminist or anti-patriarchal social engineering. Since, according to this gender constructivist ideology, women and men don't have any innate tendencies, much less any innate psychological differences caused by their different biological sexes, so theoretically their behaviors could be shaped into whatever form the system most needs of them. Like inducing more women to study engineering or making men less aggressive and more sociable.

Moreover, these houseworks were becoming out-of-the-family tasks day by day. Food industry preparing meals, companies washing bulk laundry, etc. In other words, the chores that previously people dealt with in the domestic sphere became increasingly done by workers alien to the family circle or outside home.³¹ The view that women would be liberated by participating in working life became a legitimizer of the process of integrating women into the system and making their talents and purchasing power available for the techno-industrial society.

With the second wave of feminism and other identity movements, the (third wave) left aimed at transforming people's entire private life, daily life practices and social life. This went far beyond previous feminist goals, which were limited to legal rights and economic relations, and far beyond social-democracy and socialist ideals. This transformation was also allowed and supported by the transformations that took place in the technological infrastructure of the society. Feminist manifestos at the end of the eighteenth century (such as that of Wollstonecraft), emphasized feminism's social character (e.g., seeing the "problems" of women beyond legal arrangements, in the social life itself and defining gender roles as social constructions only), but in order for enough women to grab these ideas, accept the changes in private life and family life that feminism advocated and create from these a second wave feminism, it would be necessary to wait for the sixties, when it was fostered by the changes in the social structure brought about by technological development.

The leftist utopia and the future of the wild

Leftists claim that they are pursuing a world society and a vision of life in peace, with true democracy and social equality, absence of dictatorial regimes, sharing of wealth as equally as possible, lack of poverty and misery, complete equality between men and women, and no environmental pollution or Nature destruction[884]³², and that the alternative they propose to the existing techno-industrial social system is "another" social system in which these values are truly established. They claim to have moral superiority as they defend supposedly good, beautiful and humane things. But what they are actually doing is to make it easy for technology to transform human societies according to its inner logic and to eliminate the remaining wildness on Earth

³¹ Leftist utopia consists in a society in which these collective trends go to the end, with every aspect of the whole life and the whole private space becoming a social activity. A "brave new world" where all everyday chores, from child raising to cooking, become collective and are not handled individually but by

³² What the leftists mean when they say protection of the environment is not the protection of the wild, but the protection of the natural resources and environments that the social system benefit from, in a way that enables human beings to live in a healthier (for them) and hence more productive (for the system) environment. Things like protecting drinking water resources, preventing air pollution, or reducing carbon emissions in order to reduce the effects of climate change, which poses a great danger to techno-industrial civilization.

by running people after a sacred bowl (an integrated world society that has solved all its problems) that can never be reached. The main function that leftism performs in the current social system is to act as an insurance for the techno-industrial system and push it to a point where it will function more efficiently.

Another of the goals of the left is the physical facilitation of life and the elimination of financial constraints. This means that, according to leftism, people should be able to meet their material needs without being exposed to physical difficulties and dangers. The necessity of exerting physical effort should be completely removed from daily life and the satisfaction of the needs of shelter, food, transportation, etc. should be provided by the society for the individual. However, to achieve this goal, society must be organized in a collectivistic way. This would mean the complete subjugation of individual's autonomy to social solidarity. And the only way to purge from life all kinds of physical difficulties, dangers and material problems in this way (if it can be achieved) is to improve the capacities of technological civilization to remove physical constraints. For this reason, leftism has to rely on technology as the performer of a life conception in which all the material difficulties disappear.³³

In the 19[th] century, the left believed (especially with the hegemony of Marxism in it) that the perfect world, which was dreamed free of all difficulties, would be established with incessant technological development. Accordingly, through technological development, the capacity of production could be infinitely increased, so that people would be free from the physical constraints they had ever been subjected to, and those who had been freed from these physical constraints would have reached "real freedom" eventually. For this reason, technological development had to be made continue until the end, until all limits were pushed out. But since the late sixties of the twentieth century, when the reactions of Nature to this relentless technological development manifested themselves most explicitly, it was understood that an easy, comfortable, materially abundant life could not be established on the world by defending an unlimited growth and that, beyond a certain point, this reckless growth itself removed the possibilities of establishing such a life. For this reason, the idea that the system should be more prudent in the journey of overcoming and exploiting Nature and eliminating physical constraints, and that it should take its steps more cautiously emerged. Concepts such as sustainable development, new "green" technologies, recycling and carbon footprints gradually came up and, along with them, an enthusiastic advocacy of these kinds of things by the left. The main role of the left in the system in environmental matters is to identify the excesses and deficiencies of the system, just as in the matters

³³ The constant removal from life of all the physical hardships and the incessant pursuit of material abundance has become an a priori value that no one questions. But the ultimate logical conclusion of this search will be the closure of human beings into a capsule where all external inputs that will be needed for physical needs are provided with various intubated connections, and the outputs are given out in a similar way, and psychological needs are directly met by mechanisms that artificially stimulate the brain. In today's world, where we are moving rapidly to such a point, we are beginning to experience the negative physical and psychological consequences of this together.

of social justice, and to give feedback to it in order to help technoindustrial society be able to correct itself. According to this, by adopting “green” technologies, targeting sustainability and getting to know ecosystems better, technoindustrial society could take Nature under control, the destruction of the environment would be prevented through a “sustainable” use of it and thus the system would survive. Consequently, the possibilities of establishing a life where physical difficulties and dangers are eliminated and material abundance is established would be preserved. In order to establish such a life, the existence of modern advanced technology and its further “green” development are essential.

Sustainable development and “green” technologies don’t change anything in the tendency of the techno-industrial system in subjugating and destroying wild Nature. In fact they enhance it. It is just a way for the system to try to surmount its problems with Nature and continue its functioning and expansion. In order to litter the world with all the solar panels and wind turbines needed, enormous quantities of space, energy and materials would be necessary and these would be obtained from the Earth, destroying and subjugating wild ecosystems on the way. These new “green” technologies would need to be scattered throughout the world with their corresponding transmission lines, maintenance roads, etc. and it would be inevitable that they fragmented and replaced wild ecosystems. The new “green” transformation of the human society with its wind/solar “farms” and electric cars, would require enormous quantities of special metals, which are called rare-earth metals. The mining and refining of these metals is inevitably a very destructive process and it has already caused enormous damages to Nature.³⁴ With the projected expansion of “green” technologies these damages will only increase. And furthermore, these new “green” energies aren’t freeing the system from its “old” energy sources: fossil fuels. “Green” energy sources are just another energy source for the system in order for it to keep on running its trucks, automobiles, electronic devices, etc. and thus to continue its functions and expansion.

Sustainable development experts will continue to increase their knowledge of the Earth’s ecosystems and look for the most efficient ways of exploiting the Earth’s resources. In case that the techno-industrial system isn’t able to avoid Nature’s reactions to its functioning and expansion, it probably will try to use that knowledge in an attempt to mitigate those reactions through geo-engineering activities, with the result of taking the biosphere under total control or, more probably, rendering it in total

³⁴ “Last year, China’s State Council reported that the country’s rare earths operations are causing ‘increasingly significant’ environmental problems. Half a century of rare earths mining and processing has ‘severely damaged surface vegetation, caused soil erosion, pollution, and acidification, and reduced or even eliminated food crop output,’ the council reported, adding that Chinese rare earths plants typically produce wastewater with a ‘high concentration’ of radioactive residues.” M. Ives (2013, January). [https://e360.yale.edu/features/boom_in_mining_rare_earths_poses_mounting_toxic_risks][“B]oom in Mining Rare Earths Poses Mounting Toxic Risks”, *Yale Environment* 360 [https://e360.yale.edu/features/boom_in_mining_rare_earths_poses_mounting_toxic_risks] [(https://e360.yale.edu/features/boom_in_mining_rare_earths_poses_mounting_toxic_risks)].

disarray. The aim of the left's environmental ideology is to ensure the continuation of technological development and to save the techno-industrial system from the reactions of Nature to this very development. They do this in order to sustain the possibilities of the leftist utopia: a human society which dominates Nature and in which all the physical difficulties and dangers have been eliminated and material abundance established. But such a view of life is incompatible with the wild, and the realization of the one will lead to the elimination of the other.

With its commitment to the idea of progress, leftism opens the way to the development of the social values and institutions in the direction that the technological development will need, pushing this way towards the creation of leftists' ideal, supposedly perfect society. According to the idea of progress, with the development of the technological and scientific capacities of the humankind, society will reach to a happier, more prosperous and peaceful future, and this is something absolutely good. The vast majority of leftist currents³⁵ evaluate the present basing on such perfect future that must necessarily come and which everyone has to defend morally. This is, according to leftism, an absolutely good future that development and progress must bring, and this is the best future for humanity. According to this view, any objection to such a perfect future can only be a reactionary stance, and this can't be but something undeniably bad. The flow of history has only one line and it takes us to the most worth living utopia. This teleological understanding of history attributes a positive moral value to the growth of social complexity and to technological development.

But in reality, technological and social development takes place in the process of competition between the big organizations that develop the technology, without their conscious control. Big organizations are not only corporations and states, but any large and more or less organized groups from entire societies or social systems to armies, trade-unions, NGOs, political and religious movements, etc. The main "purpose" of such large organizations is just to ensure their self-preservation/perpetuation. Their activities bring along the gradual narrowing of the power fields of individuals, who are subjected to ever more stringent controls, and whose behaviour, desires and feelings are adjusted and directed just towards the self-preservation and development of such large social and technological systems. Today, we are under the surveillance, direction and control of large organizations at every moment of our lives. It is under their control what school we are going to study and what we are taught, what job we do and how we do it, what our leisure activities will be, etc. Our physical existence is entirely up to

³⁵ There are some minority currents of leftism, like anarcho-primitivism and anti-industrialist left, who profess to be against modern technological development. But leftism, in all of its forms, invariably cherishes the values of current techno-industrial society, and ends up defending some sort of spiritual and moral progress. This renders useless these primitivist/anti-industrial leftists' alleged rejection of modern technological progress; Because the values they assume as reference points, and the spiritual and moral progress they run after have their roots in, and are not possible without, a too high degree of technological development.

them. Modern men are no different from the animals in the zoo, which have no power to control their own lives.

Large organizations will continue to increase their power in line with the development of technology. Increasing their power means that they can better control the environment they are in and the functioning of the elements that are part of them, and thus regulate them in line with their own interests (e.g., they can expand the area they control, intensify their control over their current environment and increase the amount of energy and materials they can use for their own activities.)³⁶ The ultimate logical consequence of all this would be to artificially control both the world ecosystem and human behaviour entirely, in all aspects. According to this, the increase of the power of these organizations will mean the elimination of the wildness of Nature and the control and manipulation of human natural behaviours.

But most probably, the system won't be able to completely and successfully control human societies, human natural behaviours and Earth's ecosystems due to their complexity and the ever increasing size and more demanding self-preserving functions of the large organizations that constitute it, so its attempts to control social systems, human behaviours and wild Nature will cause ever more serious and deeper disturbances and unforeseen negative effects, on the behavior of individuals, and on the functioning of human social groups and the ecosystems.

In any case, the development of technology will result in the disastrous disappearance of at least a great part of wild Nature on Earth and, along with it, the deep modification of what hitherto has been regarded to be human.

Discrepancies between leftist ideals and wild Nature

Human societies' relations with Nature and their effects on it are proportional to their technological capacities. Technological capacities are the physical instruments

³⁶ The amount of energy and mineral resources that are more easily available at the moment may decrease in the future due to their exhaustion. This would make the system turn to more and more dangerous technologies and energy and material sources that have not been used, not even reached so far, and thus the extent of the damage to wild Nature would continue to grow. We are already seeing today that the system exploits ever farther and more difficult reserves of oil (called unconventional oil) like off-shore oil rigs, tar sands and hydraulic fracturing. Solar panels and wind turbines are reaching to ever more remote parts of the world. There are attempts to try to harness the energy of the oceans and seas with wave energy converters. And an enormous amount of resources is being spent on fusion reactor projects like the ITER (International Thermonuclear Experimental Reactor). Control over human behavior will also increase with technologies like the gathering and analysis of personal data (especially with the development of computer technologies such as machine learning/artificial intelligence), genetic engineering, development of ever more sophisticated drugs, amalgamation of human body and mind with machines (cyborgs), robotics technology and the implementation of all these to more effective indoctrination and oversocialization of humans.

that a society has at its disposal. These are, for example: stone, wooden or bone (or any other animal part) tools for the primitive nomadic hunter-gatherer societies; domesticated animal and plant species, iron agricultural tools, water wheels or wind mills for traditional agricultural societies; and steam or internal combustion engines, nuclear power reactors, computers, etc. for techno-industrial societies. Increased means of technological capacities bring with themselves more power to extract, transform and absorb the material resources and energy sources of the Earth. Since primitive nomadic hunter-gatherer societies had the least developed technological means, their effects on Nature usually were quite small compared to more technologically developed societies: traditional agricultural societies and especially techno-industrial society. At the same time, in nomadic hunter-gatherer lifestyle people can live to the utmost in accordance with their natural tendencies, determined through the evolutionary processes. *Homo sapiens* evolved from our hominid ancestors throughout thousands of millennia of nomadic hunter-gatherer lifestyle. In nomadic hunter-gatherer societies, people lived in small groups and used their own mental and physical capabilities autonomously in order to survive. Their physical existence depended on their own activities and initiatives, not on some remote, collective huge organization as in complex societies. Since they used their own capacities for their own crucially important fundamental needs and they did this autonomously as part of a small group, they had the most optimal possibilities to live through the power process. For these reasons, nomadic huntergatherer societies were the least harmful to wild Nature and offered their members the best possibilities in order to experience the real freedom.³⁷

But we know that these primitive societies are precisely the ones in which leftist values (easy and comfortable life, material abundance, solidarity with strangers and large collective entities, equality between sexes, etc.) are the least valid, applicable or feasible. And the disappearance of the technological infrastructure of the industrial society would mean further decline in these values.³⁸ Therefore people who are against the technological system, who see that it destroys wild Nature and the possibilities of real freedom, should not promote the leftist values at the same time. As I have tried to show in this paper, these values started to appear with the emergence of the complex agricultural societies and their extent and density greatly increased with the industrial revolution and the subsequent accelerated development of the modern

³⁷ As I have tried to explain in the text, real freedom consists in the possibility of living in wild Nature and satisfying the physical needs with the autonomous activity of one's own capabilities, either alone or as a part of a small group.

³⁸ See[<https://vahsikaracam.blogspot.com/2020/01/ilkel-yasam-hakkindaki-gercek-anarko.html>][“The Truth about Primitive Life: A Critique of Anarcho-Primitivism”.] *Technological Slavery: The collected writings of Theodore J. Kaczynski*, Feral House, 2010, p. 126-189.

technology, because these values are necessary and greatly useful for the maintaining and the efficient functioning of the techno-industrial system.³⁹

Anarcho-primitivists and other leftists who claim to disown technological progress are no different in this regard. In fact, they totally internalize these leftist values and project them onto both their misguiding idealized image of past primitive societies and their ideal, utopian future “primitive” societies. And by promoting leftist values, they in fact are helping the technological progress which created these values in the first place. In short, the values of human communities are basically shaped by their technological infrastructures and we know that modern leftist values do not apply well in societies which do not have modern technology. Leftist values have begun to become dominant values because of the development of technology and the growing complexity of human communities, and the disappearance of this technology and complexity would mean the disappearance of these values (and the possibilities to materially apply them) to a large extent.

In the absence of advanced technology, society wouldn’t be able to further remove the natural constraints, material abundance would be gone for vast majority of people and a physically hard life would come again, as it existed before modern technology. In the absence of global communication and transportation, most people would again begin to live closely connected in small groups and the unconditional love and solidarity with a large, unknown crowd would be history. With the absence of modern occupations and economic activities, traditional daily activities would return and with them the traditional roles of men and women. Without the material resources of a technologically advanced complex society, possibilities of modern high education, health services, and scientific research would be gone too. Therefore if one’s mostly cherished values are a materially abundant and easy life, a society where natural restrictions are eliminated in the utmost fashion possible, where gender roles are erased, where everybody loves each other unconditionally, where health technologies lengthen the life expectancies and science increases its knowledge of the universe, etc. it is non-sense to be against the technological progress. And vice versa, if one wants to get rid of modern technology and of the technoindustrial social system it implies, and thus to save wild Nature, human natural character and the possibilities of real freedom from the system’s subjugation and destruction, then one has to be aware that whatever comes later won’t be a rosy and easy way of life. You can’t eat your cake and have it too.

Conclusion

Of course it is not certain, or I assume not even highly probable, that the consequences of the technological progress regarding the human condition will be in all

³⁹ The other reason why these values have become so popular and have been enthusiastically advocated by many people is that, the lifestyle of techno-industrial society makes people psychologically inclined to these kinds of values.

cases as enumerated above. If large organizations can eliminate their dependence on human labour and/or if the accelerated disturbances in ecosystems, which are created by the functioning and expansion of the technoindustrial society, started to manifest their consequences more explicitly, the results of the technological development regarding the human condition might be quite different than those we have experienced until today. But these are speculations I won't discuss here. What is certain in all scenarios is that unchecked technological development will entail even further destruction of wild Nature, greatly diminished ecosystems and perhaps the disappearance of complex life forms on Earth. This will mean the utter destruction of the conditions for real freedom. Even if we assume that human beings will be able to survive, they will be further socialized with psychological and/or biological techniques (like genetic engineering) and will live in a wasteland of greatly degraded ecosystems, artificially controlled in order to keep them within the limits in which humans can live and thus utterly dependent on large organizations and their technological abilities of regulating the outside environment.

Therefore those who cherish wild Nature and want to protect it should see the real cause of its destruction: the technological development. Those who see that people have become mere cogs in a giant machine and feel that they have lost the control, and even the meaning, of their lives should see the real reasons behind it: the ever increasing control of the large organizations over the individuals and small groups as a result of the accelerated development of the technology. And leftism is not a movement against this development but actually a promoter of it, a safety valve for the system that re-directs and absorbs the discontents and even turn them into promoters of the very values of the techno-industrial system.⁴⁰ What is needed in order to protect wild Nature and the possibility of real freedom is a movement against techno-industrial society which is free from the leftist values and confusions.

⁴⁰ This is another important function that leftism performs in the techno-industrial system, but it has not been discussed in this text. For a discussion on it see: Theodore John Kaczynski, "The System's Neatest Trick", *Technological Slavery*, pp. 190-205; and Último Reducto, "Leftism: The function of pseudocritique and pseudo-revolution in techno-industrial society"

Presentation of "Evolution, consequences and future of the domestication of plants and animals"

The following text deals with the consequences for human beings that the domestication of animals and plants has brought about at a general level during the last millennia. Except for some more than dubious details (discussed below), the article in general has a fairly accurate approach and raises very interesting questions about the development of civilization. That is why we have considered that it is worth publishing it here.

However, two important qualifications must be made:

- Diamond affirms that the domestication of plants and animals has domesticated us in turn because, by allowing the human groups that adopted it to enter into a process of civilization and technological development, the living conditions in these groups have been moving away each time more than the original ones in which their nomadic hunter-gatherer ancestors lived, affecting natural selection and this, in some individuals and groups, has caused certain changes in some of their genes. However, the author exaggerates, since these genetic changes in human beings promoted by the domestication of plants and animals and the new living conditions that this has implied are minimal. Our genome (and with it our physical and psychological traits) remains almost entirely adapted to hunter-gatherer ways of life and to life in the wild, and as a result remains highly ill-adapted to civilized living conditions. At least for now. We do not know what will happen in the future as living conditions move further away from the original primitive conditions (nomadic hunting-gathering) due to ever faster and greater technological development.

- The author ends the article with the question: "How can we guarantee that agriculture only generates happiness and does not also bring suffering?" This is the typical final declaration of good intentions of many scientific texts that otherwise correctly analyze the consequences of technological development. With it they do not offer any real technological solution, because in reality there is none, but they do not dare to admit it and prefer to leave the door open to false hopes. In matters of technological

development there is no "good" that does not come as a bad thing and the only solution would be to stop it; or better, reverse it.

And add some other secondary nuances:

- The author mentions some domestic species and compares them with other wild ones that were never domesticated despite the fact that, according to him, they are closely related. However, at least in some of the pairs of species mentioned by the author, said relationship is not so close. Specifically, almond trees (Rosaceae family) are not closely related to oaks and Holm oaks (Fagaceae family).

- The age of the domestication of dogs is still the subject of debate today (almost twenty years after Jared Diamond wrote this article), although it seems that it still predates the domestication of the rest of the species.[a]

- Diamond states that tuberculosis comes from cattle and smallpox, in turn, either from camels or from cattle. However, this is not something that is so clear. According to other authors, tuberculosis was already present in Paleolithic hunter-gatherer populations, prior to the domestication of cattle (at least between 15,000 and 20,000 years ago)[b] and some claim that it was domestic cows and goats that contracted this disease from humans.[c] For their part, others claim that smallpox is an infectious disease specific to humans that does not originate from (or affect) other animal species.[d] Be that as it may What is certain is that the agglomeration of people in civilized societies greatly increased the number of cases of both diseases, transforming them into epidemics.

Evolution, consequences and future of the domestication of plants and animals[e]

By Jared Diamond

The domestication of plants and animals is the most important invention of the last 13,000 years of human history. It is something that interests us all, whether we are scientists or not, because it provides the majority of our food today, was a prerequisite for the rise of civilization and transformed global demographics. Since domestication ultimately produced agents of conquest (for example, firearms, germs, and steel) but it arose only in a few regions of the world, and in some of those areas before others, the peoples who, thanks to biogeographical good fortune, they first acquired domestic species, gained enormous advantages over other peoples, and expanded. As a result of these substitutions, about 88% of all humans alive today speak a language belonging to one of the seven linguistic families that at the beginning of the Holocene were confined to two small regions of Eurasia that

[a] As of today (2021), the dates considered for the domestication of the dog vary between about 35,000 years ago and about 20,000 years ago. See, for example: "Origin of the domestic dog" on *Wikipedia*: [https://en.wikipedia.org/wiki/Origin_of_the_domestic_dog]

gin_of_the_domestic_dog][[https://en.wikipedia.org/wiki/ Origin of the domestic dog](https://en.wikipedia.org/wiki/Origin_of_the_domestic_dog)]and David Grimm, “Ice age Siberian hunters may have domesticated dogs 23,000 years ago”, *Science*, January 25, 2021:

[<https://www.sciencemag.org/news/2021/01/ice-age-siberian-hunters-may-have-domesticated-dogs-23000-years-ago>][<https://www.sciencemag.org/news/2021/01/ice-age-siberian-hunters-may-have-domesticated-dogs-23000-years-ago>]

[b] See, for example: “History of tuberculosis”, in *News Medical*: [<https://www.news-medical.net/health/History-of-Tuberculosis.aspx>][<https://www.news-medical.net/health/History-of-Tuberculosis.aspx>]

[<https://www.news-medical.net/health/History-of-Tuberculosis.aspx>]

[c] See, for example: “History of tuberculosis” on *Wikipedia*:

[https://en.wikipedia.org/wiki/History_of_tuberculosis][https://en.wikipedia.org/wiki/History_of_tuberculosis]

[d] See, for example: David Quammen, *Spillover: Animal Infections and the Next Human Pandemic*, Norton, 2013, pages 21-22. [There is a Spanish edition: *Contagion: the evolution of pandemics*, Debate, 2020]. Although it is possible to doubt the reliability of Quammen since, for example, this author also maintains in his book that poliomyelitis is also an infectious disease that only affects human beings, when in fact it is known that it is also transmitted at least to humans. wild chimpanzees.

[e] Translation by Último Reducto of the article “Evolution, consequences and future of plant and animal domestication”, published in *Nature*, vol. 418, August 8, 2002. © 2002 Nature Publishing Group. *N. t.* ended up being the first centers of domestication: the Fertile Crescent and certain parts of China. Through this head start, the inhabitants of those two areas spread their languages and genes over much of the rest of the world. These localized origins of domestication ultimately explain why this international scientific journal is published in an Indo-European language rather than Basque, Swahili, Quechua, or Pitjanjatjara.

Much of this article will be devoted to domestication itself: its origins, the biological changes involved, its being surprisingly restricted to so few species, its geographic origins being limited to so few places, and its subsequent geographic expansion from those areas of origin. Later I will discuss the consequences of domestication for human societies, the origins of infectious diseases, the expansion of agricultural populations, and human evolution. After raising the still unresolved questions that I would most like to see resolved, I will finish by speculating about the possible future domestications of plants and animals, and of ourselves. By domesticated species I mean a species that is cultivated or bred in captivity and thus modified from its wild ancestors in ways that make it more useful to humans who control its reproduction and (in the case of animals) its diet. Domestication is therefore different from the mere taming of animals born in the wild. The African elephants Hannibal used for war and

the modern Asian elephants used for work are only tamed wild animals, not individuals from a genetically distinct population born and bred in captivity.

In 1997 I summarized the available information about domestication and its consequences for human history in a book.¹ Since then, new details have continued to accumulate and unanswered questions have become more prominent. In general, the sources for statements not specifically referenced can be found in references 1 to 9.

The past of domestication

Our “decision” to tame

The question of “why farm and breed?” it seems silly to most of us modern human beings. It is clear that it is better to grow wheat and raise cows than to collect roots and snails. In reality, however, with hindsight, this view is incorrect. It is unlikely that food production could have arisen through a conscious decision, since the first farmers and herders had no previous model of agriculture and livestock around them to observe and, therefore, they could not have known that domestication was the goal they had to pursue, and they could not imagine the consequences that domestication would bring them. Had they really foreseen the consequences, they would certainly have prohibited the first steps in the direction of domestication, since the archaeological and ethnographic record from around the world shows that the transition from hunting and gathering to agriculture and herding it ended up resulting in more work, shorter adult stature, poorer nutritional conditions, and a higher incidence of disease.[10,11] The only peoples who could have made a conscious decision about becoming farmers and herders were the hunters- collectors who lived in the areas adjacent to the first farming and livestock communities; and in general they did not like what they saw and rejected agriculture and livestock, for those reasons already mentioned and others.

Instead, the origins of domestication involved the unintended consequences of two kinds of changes: changes in plants and animals, and changes in human behavior. As Darwin early recognized² and Rindos elaborated,³ many of the differences between domestic plants and their wild ancestors developed as a result of wild plants being selected, collected, and brought to camp by hunters- gatherers, while the roots of animal domestication lie in the general tendency of all peoples to try to tame or handle wild animals (including such unlikely candidates as ospreys,[f] hyenas, and grizzly bears). . Although humans had been manipulating wild plants and animals for a long time, hunter-gatherer behavior began to change in the late Pleistocene due to increasingly unpredictable weather, declining numbers of big game species that were preferred prey

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

³ Examples:

by hunters and to increasing human occupation of available habitats.[14,15] To reduce the risk of unpredictable variation in the food supply, people expanded their diets (the so-called broad-spectrum revolution) to foods small game and plant foods that required some preparation, such as grinding, leaching, or soaking, which they would not have chosen to have otherwise.[14,16] In the end, people did transport some wild plants (such as by example wild cereals) from their natural habitats to more productive habitats and thus began intentional cultivation.⁴

[f] “Ospreys” in the original. *Pandion haliaetus*. *N. from t.*

Figure 1. Comparisons between wild domesticated species (on the left in each pair) and their close relatives that were never domesticated (on the right) reveal the subtle factors that make domestication fail.[g]

The emerging agricultural way of life had to compete with the established hunter-gatherer way of life. Once domestication began to appear, the consequent changes that automatically occurred in the plants and animals subjected to domestication, and the competitive advantages that domestication brought to early farmers and ranchers (despite their shorter stature and poorer health) they made the transition from hunter-gatherer lifestyles to food production autocatalytic—although the speed of that transition varied considerably across regions.[18,19] Thus, the real question about the origins of agriculture, which I comment on below, is: why did food production end up prevailing in competition with the hunter-gatherer way of life in almost all the world, at the specific times and places in which it did, but not before or in other places?

Changes in wild species due to domestication

These changes are particularly well known in the case of the Fertile Crescent in Southwest Asia, the first place of domestication in history that produced what are still the most valuable domesticated plant and animal species in the world. For most of the species domesticated there, their wild ancestors and their geographic range have been identified, their relationship to domestic species has been proven by genetic and chromosomal studies, changes due to domestication (a often at the genetic level), such changes have been located in successive layers of the archaeological record and the approximate dates and locations of such domestications have been identified.[343]

For example, wild wheats and barley produce their seeds at the tip of a stem on a spike that spontaneously breaks up, letting the seeds fall to the ground where they can germinate (but where they are difficult for humans to collect). A mutation in a single gene that prevented the ear from falling apart would have been fatal in nature (because it would prevent the seeds from falling), but it turned out to be convenient for human

⁴ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “Like photosynthesizers[*]< em>, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

foragers who could thus more easily collect the seeds as they remained concentrated in the seeds. spikes. People once began harvesting those wild grain seeds, taking them back to their camps and accidentally dropping some of them, or finally sowing others, the seeds with the mutation that prevented the ear from falling apart and which in nature were unfavorably selected. , ended up being unconsciously subjected to a favorable selection for them.[9,17]

The traits of individual wild animals that made them more or less desirable to humans also varied. Chickens were selected to be larger, wild cattle (the aurochs) to be smaller, and sheep to lose their tough outer coat (the jug) and not shed their soft undercoat (the wool). Most domestic animals, including the recently domesticated trout,⁵ have smaller brains and less precise sense organs than their wild ancestors. A good brain and keen eyesight are essential for survival in the wild, but as far as humans are concerned, they represent a significant amount of wasted energy for living in a stable.[3,21]

Especially instructive are those cases in which the same ancestral species was selected by domestication for different purposes, resulting in races or varieties with very different appearances. For example, dogs were selected in many different ways: to kill wolves, to dig rats out of their burrows, to run, to serve as food, to be petted in our laps. Would an extraterrestrial zoologist seeing Irish hounds, terriers, greyhounds, Mexican hairless dogs, and chihuahuas for the first time think that they all belong to the same species? Similarly, collard greens (*Brassica oleracea*) were selected in various ways: for their leaves (cabbage and kale), stems (kohlrabi), inflorescences (broccoli and cauliflower), and buds (Brussels sprouts).).

Why so few wild species were domesticated

The wild animal species that could most easily have given rise to valuable domestic species were the large herbivorous and omnivorous terrestrial mammals weighing 45 kilograms or more, of which the world is home to 148 species (Table 9.2 in Ref. 1). However, only 14 of those 148 species were actually domesticated (Table 9.1 of ref. 1), making us wonder: what prevented the domestication of the other 134 species? Similarly, there are some 200,000 wild species of vascular plants worldwide, of which only about 100 produced domestic species. Especially surprising are the abundant cases in which only one of a group of closely related species was domesticated. For example, horses and donkeys were domesticated, but none of the four zebra species that share the genus and are capable of breeding with them were.[3,22]

The key question regarding this selectivity of domestication is this: in the case of all those species that were never domesticated, did the difficulty lie with the species themselves or rather with the indigenous peoples of the region from which those species originated? species were native? For example, has the abundance of large wild mammals

⁵ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

been the reason why no mammal species has ever been domesticated in sub-equatorial Africa, by making domestication superfluous for Africans? If this explanation were correct, then African people should have ignored Eurasian domestic mammals when they were finally introduced to Africa and European animal breeders who reached Africa should have successfully domesticated some wild African mammals, but both predictions were disproved. by the actual course of history.

Six independent lines of evidence⁶ converge to prove that, in most cases, the obstacle lies with the species themselves, not with local people: the rapid acceptance by non-Eurasian peoples of introduced Eurasian domestic species; the rapid ancient domestication of most valuable wild species; the repeated independent domestications of many of them; the failure, even by modern European plant and animal breeders, to make significant new additions to the list of valuable domestic species; the discovery of the ancient value of thousands of species that were regularly collected from the wild but were never domesticated; and the identification of the specific reasons that prevented the domestication of many of these species.

Comparisons between domesticated wild species and those closely related to them that never were illustrate the subtle factors that can make domestication fail[344] (Fig. 1). For example, it is initially surprising that oaks and holm oaks,[h] the most important wild food in many parts of Eurasia and North America, were never domesticated. Like wild almonds, the acorns of most individual oak and holm oak trees contain bitter poisons, with the occasional appearance of mutant trees with non-poisonous fruits that were favored by hunter-gatherer humans. However, the non-poisonous character is controlled by a single dominant gene in almond trees but it is polygenic in oaks and holm oaks, so that in almond trees the offspring of the occasional non-poisonous individual is also often not poisonous, but it rarely happens. the same with oaks and holm oaks, preventing to this day the selection of varieties of oaks and holm oaks with edible acorns. A second example is the case of European horse breeders who settled in South Africa in the 17th century and - like African herders in previous millennia - tried to domesticate zebras. They abandoned the attempt after several centuries for two reasons. First, zebras are incurably aggressive, they have a bad habit of biting their keepers and they won't stop biting until they are killed, so that in zoos each year more keepers are injured by zebras than by tigers. Second, zebras have better peripheral vision than horses, making it impossible for even a professional rodeo cowboy to lasso them (they see the rope coming and turn their heads away).

Among wild mammalian species that were never domesticated, the top six obstacles have proven to be a diet that is not easily supplied by humans (hence no domesticated anteaters), slow growth rate, and widely spaced births. (for example, in elephants and gorillas), bad character (grizzly bears and rhinoceroses), reluctance to reproduce in captivity (pandas and cheetahs), absence of dominance hierarchies based on following

⁶ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

a leader (Rocky sheep and antelopes) and a tendency to panic in enclosed spaces or when confronted with predators (gazelles and deer, except reindeer). Many species pass five of these six tests but still cannot be domesticated because they fail the sixth. Drawing conclusions about non-domesticability from the fact of the absence of domestication is not a form of circular thinking, since these six obstacles can be examined independently.

Why there were so few areas of origin of agriculture

Food production gave farmers and ranchers enormous demographic, technological, political, and military advantages over their hunter-gatherer neighbors. The history of the last 13,000 years consists of tales of how hunter-gatherer societies were gradually driven out, infected, conquered, or exterminated by farming and herding societies in every region of the world that was suitable for farming and hunting. cattle raising. Therefore, one could naively anticipate that, in any part of the world, one or more of the hunter-gatherer societies would have discovered domestication, become farmers and herders, and at most nine world regions (the Fertile Crescent, China, Mesoamerica, the Andes/Amazon, the eastern United States, the Sahel, western tropical Africa, Ethiopia, and New Guinea).

The puzzle becomes more complicated when that list of originating regions is analyzed. Again, one could naively expect that the most productive areas for agriculture and livestock today would correspond, at least roughly, to the most productive areas of the past. In reality, the list of original regions and the list of granaries of the modern world are almost mutually exclusive (Fig. 2). This last list is made up of California, the Great Plains of North America, Europe, the pampas of Argentina, the southern tip of Africa, the Indian subcontinent, Java and the grain belt of Australia. If these areas are obviously so suitable for farming and ranching today, why weren't they in the past?

The explanation is that the original regions of agriculture were merely those regions to which the most valuable domesticable species of plants and wild animals were native. Only in these areas were the first incipient farmers and ranchers able to competitively outcompete the hunter-gatherers. Once these locally available wild species had been domesticated and spread outside their areas of origin, the societies of the original regions ceased to have that initial advantage, and were eventually outcompeted outside the original regions by societies from more fertile or climatically more fertile areas. more favourable.

For example, the Fertile Crescent of Southwest Asia was home to wheat, barley, peas, sheep, goats, cattle, and wild pigs - a list made up of those that remain the most popular crops and livestock. valuables of the modern world. Hence, hunter-gatherers in the Fertile Crescent began to domesticate these species and became the first farmers and herders around 8500 BC.[1,9,23] That initial advantage in food production led them and their nearby neighbors to also develop the first metal tools, the first writings, the first empires and the first professional armies in the world. These tools of conquest, and the human genes of the Fertile Crescent, gradually spread west across Europe

and North Africa, and east across the western Indian subcontinent and central Asia. However, once such crops, livestock, and human inventions had become widespread, the societies of the Fertile Crescent no longer had any other advantages. As all these elements spread across Europe, agriculture, herding, and power also moved northwest from the Fertile Crescent into areas where farming and herding had never emerged independently - first to Greece, then to Europe. Italy and finally northwestern Europe. Human societies in the Fertile Crescent inadvertently committed slow suicide in a low-rainfall area prone to deforestation and soil erosion and salinization.

Figure 2. The ancient and modern centers of agriculture. *The ancient centers of the origin of the domestication of plants and animals -the nine regions of origin of food production - are indicated by the orange areas of the map (based on Fig. 5.1 of ref. 1). The most productive agricultural regions of the modern world, judged by their production of cereals and major staple foods, are indicated on the map by the yellow areas. Note that there is almost no overlap between the indicated areas, except that China appears in both distributions and that the most productive areas in the central United States today are close to the areas in the eastern United States where the spread originated. domestication. The reason the two distributions are so different is that agriculture arose in those areas to which the wild ancestors of the most valuable domesticated crops and animals were native, but other areas proved much more productive when those domesticated species came to them. .⁷*

The expansion of food production

From the regions of origin of domestication, food production spread around the world in two ways. A very unusual way was for hunter-gatherers from outside the original regions to acquire crops or livestock from the original regions, which would allow them to settle as farmers and herders, as archaeological evidence attests to the substantial continuity present in the culture. material and the genetic, linguistic, and skeletal evidence for continuity present in human populations. The clearest example of local adoption of food production occurred in southern Africa, where around 2,000 years ago some Khoisan hunter-gatherers acquired Eurasian livestock (cattle, sheep, and goats) from the north and became herders (the so-called Hottentots). Far more often, however, local hunter-gatherers had no opportunity to acquire crops or livestock before being invaded or replaced by farmers and ranchers who spread out from the original regions exploiting their demographic, technological, political, and economic advantages. military compared to hunter-gatherers.

Expansions of crops, livestock, and even people and technologies tend to occur more rapidly along east-west axes than along north-south axes (Fig. 3).[346][346] The reason is obvious: places at the same latitude share identical day lengths and seasonalities,

⁷ The names of the colored areas in the figure could not be translated. However, with little knowledge of geography, they will be obvious even to those who do not know English. *N. from t.*

often share similar climates, habitats, and diseases, and thus require fewer changes or evolutionary adaptations from domestic species, technologies, and cultures than they do. places located at different latitudes. Examples of this would be the rapid dispersal along the east-west axis of Eurasia of wheat, horses, wheels, and writing, originating from West Asia, to the west and east, and the dispersal of chickens, citrus and peaches, whose origin was China, to the west. This contrasts with the slow southward expansion of Eurasian cattle and the complete lack of Eurasian crop expansion along Africa's north-south axis,⁸ the slow expansion of Mexican maize, or the complete lack of expansion of Mexican writing and wheels and llamas and potatoes from the Andes, along the north-south axis of America and the slow spread of food production southward along the north-south axis of the Indian subcontinent.

This does not deny the existence of ecological barriers located at the same latitude in Africa[j] and North America, but the general pattern holds. The east-west axis of Eurasia, and the resulting rapid widespread enrichment of Eurasian societies through crops and technologies originating from other parts of Eurasia, became one of the main ultimate reasons why Eurasian peoples conquered Native American peoples, instead of being the other way around. The east-west axis of Eurasia also explains why there is much less evidence for multiple independent domestications of the same plant species (see below), and much more evidence for agriculturally driven expansion of languages, in Eurasia than in the Americas.

The consequences of domestication

Consequences for human societies

Around 8500 BC, the transition from a hunter-gatherer way of life to food production began that allowed people to settle next to their orchards, plantations, and permanent pastures rather than migrate to follow seasonal shifts in food sources. wild. (Some hunter-gatherer societies that lived in especially productive environments also became sedentary, but most were not.) Food production was accompanied by an explosion in the human population, which has continued uninterrupted to this day, and was the result of two independent factors. First, the sedentary way of life allowed the intervals between births to be shortened. Until then, nomadic hunter-gatherers had maintained long birth intervals of four years or more, for when camp sites are changed, a mother can only carry a baby or pull a slow toddler who can barely walk . . Second, plant and animal species that are edible to humans can be cultivated and raised at much higher densities in our orchards, plantations, and pastures than in wild habitats.

Figure 3. *The main continental axis is oriented from east to west in Eurasia but from north to south in the Americas and Africa. The expansion of food production*

⁸ “Chipmunks” in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

tended to occur faster along east-west axes than along north-south axes, mainly because locations at the same latitude required domestic species to undergo fewer changes or evolutionary adaptations than places located at different latitudes. Modified from Fig. 10.1 of ref. 1.

Food production also led to an explosion of technology, as sedentary life allowed the accumulation of heavy technology (such as forges and printing presses) that hunter-gatherers could not carry and because storable food surpluses from agriculture could be used to feed individuals who worked full time as artisans and inventors. Also, by sustaining kings, bureaucrats, nobles, and full-time soldiers, these food surpluses led to social stratification, political centralization, and standing armies. All these overwhelming advantages are what allowed farmers and ranchers to end up displacing hunter-gatherers.⁹

Evolution of epidemic infectious diseases

The major killers of humans since the advent of agriculture have been acute, highly infectious epidemic diseases that are confined to humans and either kill their victims quickly or, if the victim recovers, immunize them for life. . These types of diseases may not have existed before the origins of agriculture, as they can only be perpetuated in large and dense populations that did not exist before the advent of agriculture, hence they are often referred to as “mass diseases”. [k] The mystery of the origins of many of these diseases has been solved by molecular biological studies in recent decades, showing that they evolved from similar epidemic diseases of our domestic livestock, with which we came into close contact 10,000 years ago years. Thus, the evolution of these diseases depended on two independent roles played by domestication: it gave rise to much denser human populations, and it allowed the transmission of animal diseases from our domestic species to be much more frequent than it had been. been from the hunted wild animals. For example, measles and tuberculosis arose from diseases of cattle, and influenza from a disease of pigs and ducks.¹⁰ The origins of smallpox remain a remarkable mystery: does it come from camels or cattle?

Paradoxically, mass diseases became agents of conquest, since individuals who had been exposed to them since childhood acquired immune resistance while unexposed populations did not have any resistance. In practice, since 13 of our 14 large domestic mammals were Eurasian species, the evolution of mass disease was concentrated in Eurasia, and disease became the most important agent by which Eurasian settlers expanding overseas killed to the indigenous peoples of the Americas, Australia, the Pacific Islands and southern Africa.

⁹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

¹⁰ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

Agricultural expansions

Since some peoples acquired domesticated species earlier than others, and since domesticated species ended up conferring advantages such as firearms, germs, and steel on those who possessed them, the history of the past 10,000 years has been one of farmers and ranchers displacing hunter-gatherers or other less advanced farmers and ranchers. These agricultural expansions, which began primarily in the original regions of agriculture, rewrote the genetic and linguistic maps of the world (Table 18.2 in ref. 1). Among the most studied (and often highly controversial) examples are the expansions of Bantu-speaking farmers and herders from tropical West Africa into subequatorial Africa,¹¹ that of Austronesian-speaking farmers and herders from Taiwan to Southeast Asia,¹² the Fertile Crescent farmers and ranchers across Europe,[31,32] and the Korean farmers and ranchers in Japan.¹³

Human genetic evolution

Domestication has been by far the most important cause of changes in human gene frequencies over the last 10,000 years. Among the mechanisms responsible for this are: the expansion of human genes originating in the regions of origin of agriculture; the evolution of genetic resistance factors (including A, B, and O blood groups) to our new mass infectious diseases;[34,35] the evolution of lactase persistence in adults in the

[k] “Crowd diseases” in the original. *N. from t.* populations of northern Europe and certain parts of Africa who consumed milk; the evolution of allozymes for alcohol metabolism that made it possible to consume large amounts of beer (a nutritionally important food) in western Eurasia; and the evolution of adaptations to a diet higher in carbohydrates and saturated fats and, in modern times, in calories and salt, and poorer in fiber, carbohydrates, calcium, and unsaturated fats, than the hunter-gatherer diet.[36]

Unresolved issues

Among many unanswered questions, here I will focus on six: what caused the rise of agriculture around 8500 BC and why did it not happen before? Did the domesticated species come from a single case of domestication or were there multiple independent

¹¹ “DNR” in the original. “Department of Natural Resources”. *N. from trans.*

¹² “Rat wall” in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

¹³ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

cases of domestication? Can the regions in which food production appeared be divided into primary and secondary originary regions, the latter being those regions in which the arrival of crops from the primary originary regions caused local domestication? How did food production spread? Why were the large domestic mammals predominantly Eurasian? And how can we gain a better understanding of the domestication history of particular species?

Why then and not before?

The human lineage diverged from that of the chimpanzees around 6,000,000 years ago. For the next 99.8% of our history as an independent genus, there was no agriculture, until it emerged independently in as many as nine regions across four continents in a short period of 6,000 years, between 8500 and 2500 BC. All these almost simultaneous independent origins seem like too much of a coincidence. So what repeatedly caused agriculture to appear? And why had it never arisen during the previous 6,000,000 years?

Posing the questions in this way on the one hand undervalues the puzzle and on the other overvalues it. It underestimates it because there were not only, at most, nine trajectories of intensification that culminated in agriculture, but also many others that did not (or at least had not yet done so at the time when European conquest aborted them). . Among the regions of the world where Holocene hunter-gatherers developed higher population densities, complex material cultures and, in some cases, pottery and (according to some anthropologists) sedentary lifestyles and chiefdomized class societies are the Mesolithic Europe, Japan, the Asian Far East littoral, the North American High Arctic, the Pacific coast of northwestern North America, the oak forest regions of California's interior, the California Channel Islands, the Calusa of Florida, the coast of Ecuador and the Murray-Darling Basin in south-eastern Australia (for examples, see ref. 3739). Although a similar intensification of hunter-gatherer societies also preceded the rise of food production in their original nine regions, I suspect that the only difference between regions where people remained hunter-gatherers and regions where they were developed the production of food was that among the species of plants and animals collected in the latter there were some that were automatically transformed into domestic species, while this did not happen in the former, as has already been commented above. Thus, there were not just 5-9 independent intensification trajectories during the Holocene, but several dozen.

On the other hand, the way I've phrased the question also overstates the puzzle. Only behaviorally modern *Homo sapiens* were biologically and mentally capable of the technological advances and efficiency improvements that would result in the intensification of hunting and gathering, and (sometimes) the food production.[40] however, behaviorally modern *Homo sapiens* did not emerge until about 55,000 to 80,000 years ago (the exact date is disputed), so we should not say that simultaneous independent emergences were concentrated in the last 0.2% of hominid history, but "only" in the last 15% of modern human history. Even so, so many simultaneous appearances seem too concentrated to be mere coincidence. Did the origin of behaviorally modern *Homo*

sapiens by chance synchronize clocks so that they ticked at the same rate all over the world? This is hard to believe, especially when there were more regions where intensified hunter-gatherer economies did not emerge than regions where they did.

It seems to me that a possible explanation can be inferred from four processes that occurred in the final Pleistocene which may in fact have caused this synchronization. The first was that improvements in the hunting abilities of humans, and the consequent depletion or extermination of the large mammals that served as their prey, might have made the hunter-gatherer way of life less profitable and less capable of hunting. to compete with food production. The second was the development of human technology to harvest, process, and store wild foods (such as wild grains), without which subsequently exploiting those same species as domestic food sources would have been impossible (I mean, what's the point of plant wheat if you have not yet determined how to harvest, roast and store it?). The third process was the continuous competition between human societies, so that at any time those societies that have possessed a more efficient technology have imposed themselves on the rest of contemporary societies. And fourth, the gradual increase in the size of the human population during the Pleistocene that required intensifying the food supply to feed larger populations.

In this context of gradual change, the events that could have caused intensification and food production to emerge only after the Pleistocene could have been the changes in temperature and precipitation and the climatic unpredictability of the late Pleistocene. These changes may have reduced the broad dietary spectrum[14-17] and made agriculture possible in areas where it would have been impossible during the Ice Age (by allowing, for example, the expansion of forested habitats with understory composed of wild cereals in the Fertile Crescent).¹⁴ Thus, once food production had begun, the autocatalytic nature of the many changes that accompanied domestication (for example, more food which stimulated population growth which in turn required even more food) made the transition was fast. On this interpretation, the independent occurrences of food production no longer seem so simultaneous - they could not have taken place before the end of the Pleistocene (11,000 BC), and after the end of the Pleistocene they occurred at very different times, ranging from the 8500 BC (in the Fertile Crescent) to about 2500 BC (in eastern North America). Clearly, most of the connections in this speculative hypothesis need to be tested.

Multiple domestications versus single domestications

An old question is whether each crop and livestock species stems from a single instance of domestication within a restricted geographic area, or whether it stems from multiple independent domestications in different places. The recent accumulation of evidence suggests to me the following generalization: the first interpretation would explain the rise of most of the major Eurasian crops, and the second interpretation would explain the rise of many of the New World crops and the major Eurasian species of livestock.

¹⁴ 1 mile is approximately 1.6 km. *N. from t.*

Among New World crops, many are represented by different related species in South America, Mesoamerica, and the eastern United States, leaving no doubt as to whether related species were domesticated independently in each of those regions (ie. which seems to have happened, for example, in the cases of beans, lamb's lettuce, peppers, cotton, pumpkins, tobacco and possibly amaranths). Multiple independent domestications have been attested for the same species in the cases of the pepper *Capsicum annuum*, the common bean *Phaseolus vulgaris*, the lima bean *Phaseolus lunatus* > and squash *Cucurbita pepo*. [4,7,8,42] By contrast, of the eight crops on which agriculture was founded in the Fertile Crescent, all of them, with the possible exception of barley, appear to derive from a single instance of domestication. [5,9,43-45]

Today there is evidence of separate, independent domestications in western and eastern parts of Eurasia for all of the "big five" domesticated mammals (cow, sheep, goat, pig, and horse), plus one of the "lesser nine" (the buffalo). aquatic[l]). [46-54] For example, cattle were domesticated independently in the Fertile Crescent (giving rise to modern humpless cattle), on the Indian subcontinent (giving rise to humped or zebu) and in North Africa. [46,50,53]

I suggest the following hypothesis to explain why the domestications of the founding crops of the Fertile Crescent were predominantly single but those of Eurasian cattle and many of the New World crops were multiple. Except for barley and flax, the wild ancestors of the Fertile Crescent's founding crops had restricted geographic ranges confined to the area between present-day Turkey and western Iran; although chickpea was even more restricted in southeastern Turkey. These reduced geographic ranges, coupled with the rapid expansion of domesticated species along the east-west axis of Eurasia, meant that once a wild plant had been domesticated, it spread so rapidly that there was no time to that subsequent independent domestications of it were produced. The large Eurasian mammals, however, had such extensive geographic ranges (in the case of pigs, they stretched over 13,000 km, from Spain to China) that there was plenty of time for later independent domestication in remote locations. located both east and west of each other. In the New World, even though all the original regions of agriculture are only 4,000 km apart, the slow spread of crops along the north-south axis of the New World meant that frequent independent domestications occurred. The spread was so slow that the major domesticated animal species of the New World - the llamas and guinea pigs of the Andes and the turkey of Mexico - had spread no further than 2,000 km north of Mexico and only as far west as the Andes. south, respectively, when the Europeans arrived in 1492.¹⁵

¹⁵ "Water buffalo" in the original. *Bubalus bubalis*. N. of the t.

Primary originating regions vs. secondary originating regions

In various parts of the world, food production arose from the arrival of domestic species from primary native regions, after which people proceeded to domesticate some local species that had not been previously domesticated.[348] Clear examples of such "secondary" ancestral regions, where domestication occurred due to the arrival of crops from the Fertile Crescent, were Europe (with the local domestication of poppies and possibly oats) and Egypt (with the local domestication of local tiger nut and fig tree).

The recognition of these secondary originary regions requires that we reconsider the supposedly primary regions. On the one hand, some of the primary source regions can best be seen as consisting of multiple, closely related source regions in which distinct food production systems arose independently. This is true especially for the Andes/Amazon region, which consisted mainly of lowland sites stretching from Panama to the Pacific coast of Ecuador and Peru, passing through the Amazon basin.[55, 56] Similarly, the original regions of Mesoamerica and the Fertile Crescent could have been considered as a mixture of highland and lowland sites, while that of China probably consisted of sites in the north and south of the basins. the Yellow and Yangtze rivers, respectively, as well as sites in the coastal lowlands and inland highlands.

On the other hand, some of the nine candidate primary regions may actually be secondary regions where domestication was triggered by the arrival of domestic species or by farmers and ranchers from elsewhere. Independent origins of food production seem unquestionable for five of the candidates (the Fertile Crescent, China, Mesoamerica, South America, and the eastern United States), as they were the earliest sites of domestication in their respective parts of the world. However, doubts have been raised with me, at least in conversations, about the independence of the other four candidates. Especially unclear is the status of Ethiopia, where it is not known whether several of the unequivocal local domesticated species (teff,[m] coffee, finger millet,[n] qat,[o] nug[p] and enset[q]) were cultivated before or only after the arrival of domestic species from the Fertile Crescent, and that of the highlands of New Guinea, where, although remains of irrigation and drainage systems attest to the early existence of agriculture, the first cultivated species remain unidentified and the earliest dates of food production remain controversial. Even the independence of the eastern United States has recently been called into question,[42,57] yet the evidence that Mexican crops arrived there long after local domestication had taken place seems convincing.[8,58] For In contrast, in southern India the exact dates of the arrival of domestic species from the Fertile Crescent and of the first cultivation of local domestic species remain unclear.

Mechanisms of diffusion of food production

As I have already pointed out, the spread of agriculture from its regions of origin involved, in a few cases, the acquisition of domestic species by hunter-gatherers from outside those regions, but on many more occasions it involved the expansion of farmers and ranchers themselves outside the regions of origin. The contributions of these two processes await to be clarified in many other cases. For example, despite what I wrote five years ago,¹⁶ today it seems that the spread of agriculture and livestock along the coast of western Mediterranean Europe (in the form of the cardial and incised pottery cultures) involved the rapid sea transportation of a whole assemblage of domestic species around 5400 BC by settler farmers and ranchers.¹⁷ Marking the arrival of intensive rice farming in Japan, which Japanese scholars until recently preferred to see as an adoption of practices from the mainland by the pre-existing indigenous Japanese population, the Yayoi horizon now seems increasingly more likely to represent the arrival, population growth, and expansion of 33 Korean farmers and ranchers.¹⁸

Why the large domestic mammals were mainly Eurasian

In part, the reason large domestic mammals were primarily Eurasian is simply that Eurasia, being the largest of the continents and having escaped the late Pleistocene extinctions that wiped out most large mammal species in the Americas and Australia,¹⁹ has the largest number of species of large wild mammals. However, there is a second part to the answer to this question: a much higher percentage of large mammalian species (18%) turned out to be domesticable in Eurasia than in any other continent (Table 9.2 in ref. 1). The contrast between Eurasia and sub-Saharan Africa, where none of the 51 large mammal species turned out to be domesticable, is especially striking.

This difference is not due to a problem with human behaviour, but with the behavior and sociobiology of animals - something in African environments selected for one or more of the six characteristics that make domestication difficult. We already gave some hints above, such as that many of Africa's large mammals are antelope species and other open-space animals whose herds lack the leader-based dominance hierarchies characteristic of cattle, sheep, Eurasian goats and horses.[3,61] To solve this puzzle, I suggest trying to assign one or more of the six traits that preclude domestication to each of the non-domesticated species of Eurasian and African large mammals and then assessing the environmental factors that act on each of the traits.

¹⁶ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

¹⁷ There is a Spanish translation of "Thinking like a mountain" in *An Ethics of the Earth*. Cataract Books, 2005. *N. from t.*

¹⁸ "Wilderness way" in the original. "Wilderness" is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as "wild nature". Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

¹⁹ "Wildness" in the original. *N. from t.*

History of domestication of specific species

The history of domestication is much better understood in the case of Eurasian domestic species than in other parts of the world. If the history of plant domestication in western Eurasia according to Zohary and Hopf is taken as a reference,²⁰ it will be difficult for those working on other biotas to find matches with such a reference. Even for western Eurasia, unanswered questions abound. To mention just one of dozens of them, calculations of molecular divergence times between dogs and wolves suggest that wolf domestication began around 100,000 years ago,[62,63] but the marked morphological differences between wolves and dogs (which should be easily detectable in fossil skeletons) did not appear until about 11,000 years ago. How can molecular data be reconciled with morphological data?

The future of domestication

Subsequent domestication of plants and animals

Human beings today depend for our survival on that tiny fraction of wild species that has been domesticated. Could the development of molecular biology, genetics, and understanding of animal behavior help feed our growing population by increasing that minuscule fraction? In fact, modern science has already made it technically possible to "tame" species that were impossible to tame in the past, in the sense that we have gained much more draconian control over the captive breeding of the endangered California condors (matched through breeding). use of computers in mating, thus maximizing their genetic diversity) than the low-tech control that ancient animal breeders exercised over their livestock. However, while this "domestication" may be of great interest to conservation biologists, it holds no promise that a condor-producing industry will displace chickens from supermarket shelves. What wild species could be profitably domesticated today?

It is instructive to reflect on the few new additions to our repertoire of domestic species in recent millennia. Of the world's 14 valuable large domestic mammals, the only addition over the last millennium has been reindeer, one of the least valuable of

²⁰ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

the 14 species. (By contrast, the five most valuable - sheep, the goat, the cow, the pig and the horse - were all repeatedly domesticated around 4000 BC). Continued attempts by modern cattle breeders to domesticate other large wild mammals have turned out to be either mostly unsuccessful (as has happened, for example, with the eland,[r] wapiti,[349][350] the moose,[t] the musk ox[u] and the zebra) or a mere confinement in farms of the animals (deer or American bison), which are still unable to be grazed and continue to be of inconsequential economic value compared to the five most valuable large domestic mammals. In fact, all mammalian species that have recently become well-established domestic species (for example, the arctic fox,[v] the chinchilla,[w] the hamster, the laboratory rat, and the rabbit) are small mammals, of reduced utility and size compared to cows or sheep. Similarly, although several wild plants have been first domesticated only in modern times (for example, blueberries,[x] macadamias,[y] pecans[z], and strawberries), their value is negligible compared to that of ancient domestic species such as wheat or rice.

Our best hopes of achieving valuable new domestic species lie in recognizing the specific difficulties that previously failed to domesticate particular valuable wild species and using modern science to overcome these difficulties. For example, since we now understand the polygenic origin of non-bitterness in acorns, perhaps we could use that knowledge to select oaks and holm oaks with non-bittering acorns, just as ancient farmers selected for controlled non-bitterness. by a single gene in almond trees. I worry, however, that such attempts may do us more harm than good in the long run. The greatest risk for humanity today is that our population size and our growing aspirations end up destroying our society by destroying our environment. Providing more food to malnourished people would be a laudable goal if it were inexorably linked to a reduction in our numbers, but in the past more food has always resulted in more people. Only when plant and animal breeders also take the initiative to reduce our numbers and impacts can they do us a net good.

Future domestication of humans

Some of the genotypes that used to be useful to us in the past, when we lived as hunter-gatherers, today turn out to be of little use to us First World citizens who gather our food in supermarkets - especially the genotypes that promote thrift. metabolic, which today predispose us to type II diabetes; the genotypes that help in the conservation of salts, which predispose us to hypertension; as well as other genotypes that predispose us to other cardiovascular diseases and lipid metabolism disorders. As populations that previously led Spartan lifestyles have become Westernized ("coca-colonized"),²¹ they fall victim to these diseases of the Western way of life, extreme examples being an incidence of diabetes type II of 70% in those Nauruan islanders and Pima Indians who are lucky enough to survive to age 60 (ref. 65). With diabetes

²¹ "Arctic National Wildlife Refuge" in original. *N. from t.*

now affecting even South Asians and Pacific Islanders in their early twenties with high morbidity and mortality, detectable natural selection has occurred over the past few decades against genotypes that predispose to it. The lower frequency of type II diabetes in Europeans than in non-Europeans, for the same diets and lifestyles, suggests that natural selection had already been reducing the frequencies of these genotypes in previous centuries, as the lifestyle Western life was developing in Europe. Indeed, the unconscious domestication of humans through agriculture, which began over 10,000 years ago, is still ongoing.

In the near future, as Westernization accelerates in the world's two most populous countries, China and India, even more cases of such shifts in gene frequencies, also known as disease and death, are expected to occur.[66,67] For example, the incidence of type II diabetes in mainland China, which until recently was less than 1%, has already tripled in certain areas. What lies ahead for China in the future can be foreseen by considering the overseas Chinese populations in Hong Kong, Taiwan, Singapore and Mauritius, where Westernization is most advanced and the incidence of type II diabetes is already over 17 %. Similarly, the incidence of diabetes in Indian populations outside India, such as in Fiji, gives us a foretaste of the future of this disease in India itself.

The resulting projections are that the number of diabetes cases is expected to increase by 46% worldwide between the years 2000 and 2010, reaching about 220 million in 2010 and about 300 million in 2025. The steepest increase will occur in East Asia (including China and India), the projected home of 60% of the world's diabetics in 2010. Similar epidemics of diet-related disease are occurring in fewer peoples (from Africans to Aboriginal Australians), implicating not only diabetes but also hypertension and other problems. Thus, these epidemics pose the same dilemma as attempts to domesticate more species of wild plants and animals: how can we ensure that agriculture only brings happiness and does not also bring suffering?

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Presentation of “Current demographics suggest that future energy supplies will be inadequate to slow human population growth”

The belief that the human population will eventually stabilize in the near future is quite pervasive in techno-industrial society and is often used to try to downplay warnings about overpopulation. This belief is based on an optimistic interpretation of the phenomenon known as “demographic transition”, which consists in the fact that as countries develop socially and technologically, their population growth slows down, stops or even in some cases is reversed. This has led many to believe that the world population will end up stabilizing when the level of social and technological development that the most industrialized countries have today becomes sufficiently widespread at the global level. It would be what the authors of the article call “the industrial path to zero (demographic) growth”, as opposed to “the ecological path to zero (demographic) growth” which would be the phenomenon that occurs when populations stop growing or decrease due to the *extreme* scarcity of resources and energy.

The interest of the article that we present below consists in the fact that it seriously questions the validity of this belief since, according to the authors’ calculations, the available energy will very probably not be enough for the industrial path towards zero growth to take place. This is a cold water jug for all those techno-optimistic humanists and progressives who try to downplay the problem of overpopulation by talking about future demographic stabilizations due to development.

Even so, we would like to comment and clarify certain aspects of the article:

- Some readers may find it paradoxical that the authors suggest that the shortage of energy will cause the population to continue to increase and not the other way around. Aren’t they overlooking certain factors and possibilities? Is it not rather that, if the energy and resources are not sufficient for the demographic transition to take place, then the population will decrease due to an increase in the mortality rate due to diseases, wars or other factors? And could it not happen that in the future the population decreases anyway because a decrease in the birth rate is legally imposed by legal obligation (as in China years ago with the “one child policy”)?

Let's go by parts:

To understand why this paradox does not really exist, the following must be taken into account: when the scarcity of energy and resources is such that it threatens survival, the population also decreases (especially due to an increase in mortality; it is what the authors call the "ecological path to zero growth"). And, conversely, if one day societies became so rich and powerful that there were plenty of energy and resources for everyone and *everything* and they could overcome *all* physical limitations, and if by then there were still human beings, then very likely the population would also grow again in them (because having and raising many children would cost us nothing). However, at *intermediate* scales of energy and resources (neither too scarce nor too abundant) things work differently[.] Human societies today, both in developed countries and in most of the underdeveloped, are within this *intermediate* range, without extreme scarcity and with a fairly high per capita energy consumption, although not with enough abundance to not continue to be subject to serious physical limitations. Thus, in most developing countries, although there is a certain scarcity compared to developed countries and therefore their consumption of energy and resources is not high enough to allow them to reach their high levels of development, said scarcity is not so serious as to prevent the subsistence and reproduction of most of the population, and that is why it continues to grow. While in the most developed countries, the population tends to stabilize or even decrease.

But why then does the population not grow more in developed countries, where it has more resources at its disposal, but even decreases? Why is this "demographic transition" taking place in countries as their level of technological and social development increases? Progressives often say that it is because in advanced societies women have more power, freedom, and economic independence, and therefore may decide not to have as many children and instead pursue - that is, invest their time, energy, and resources in - other different things from raising them (things that are supposed to be more *chachipirulis*, they "do" them more as people, they are more important and "spiritually elevated", etc.). Others say that it is because in developed societies children are very expensive: raising them "properly" (that is, according to the canons in force in said societies) requires a great investment of time, effort and money from the parents, who therefore, Unless they are very wealthy, they usually avoid having many children. Others say that it may be due to reasons of a psychological nature - modern living conditions induce psychological states that make many individuals tend not to want to reproduce - and ideological - the prevailing values and ideas in techno-industrial societies make people prefer to reproduce less. Others say that it is actually because of contraceptives and birth control using modern technologies, since without them people would not be able to carry out their decision to have fewer children so easily. And it is probably a combination of at least some of these reasons (or others) in different proportions. The fact is that, for whatever reason and however contradictory this fact may seem in principle, in more technologically and socially developed societies population growth slows down or even reverses.

As for the possible increase in mortality due to diseases, wars, famine, etc. It would also surely enter what the authors call the “ecological path to zero growth”, because wars and diseases are often favored by extreme scarcity (below the minimum for survival and reproduction). If at any point scarcity increases to a point where it threatens survival, such an increase in mortality will happen. And this possibility is actually implicit in the authors’ conclusion that the “industrial path to zero growth” is unlikely to occur globally. If the “industrial path to zero growth” does not occur, the alternative, sooner or later (after a period of population growth), is the “ecological path to zero growth”.

And as for the control of population growth through laws, it is also a possibility, but it is not so easy for it to happen worldwide. First, it didn’t even fully work in China and in the end the Chinese government had to repeal the law. And China is the only place we know of where something similar has been seriously attempted to date. Second, most governments and people are more concerned with slowing population decline (in growth) than encouraging it (governments often even tend to subsidize childbearing in various ways), for economic reasons (the well-known refrain about ensuring pensions, promoting consumption, etc.). Third, reproducing is basically the meaning of life for every living being, it is the fundamental tendency of people, the essence of their nature (*in principle*, all other behaviors and natural psychological traits are explain based on it). Trying to massively repress this fundamental instinct is very difficult and would cause a lot of problems in turn. In addition, it would imply a degree of social engineering that would not only be abhorrent from the point of view of social control, the lack of individual freedom and the problems it would cause, but would not even be feasible on a practical level (it would require a propaganda apparatus and incredibly large and powerful law enforcement agency to make such a birth control program work minimally efficiently on a global basis).

Certainly, it is questionable to what extent the authors’ forecasts will be accurate and whether they are taking into account all the possibilities and factors that could influence. The former is impossible to determine *a priori*, because we know that the development of societies is largely unpredictable. Although it is likely that the authors’ predictions will not end up being completely correct, it is not yet known to what extent they will be or not. Although this is also recognized by them in the text. What the authors (as well as most scientists and other people trying to make predictions of the future development of the techno-industrial system) do is just extrapolate from historical trends (keep drawing the curves from the present). based on the known trajectories of the past) and that, although probable, is not certain (factors may appear that modify said trajectories). If reality does anything, it changes trajectory often and unexpectedly.

Regarding the second doubt, that is, if the authors take into account all the possibilities and factors, the authors basically pose only two possibilities: either, if the energy is not enough for a demographic transition to take place on a global scale, either the human population will continue to grow even more, or else, in the unlikely event

that sufficient energy is obtained for such a demographic transition to occur, then the one that would probably continue to grow indefinitely would be the techno-industrial system.[a] However, the authors barely mention that there are other

[a] For example, it could happen that nuclear fusion could be controlled and unlimited energy available, with which the techno-industrial system would give a tremendous acceleration and would be alternatives: as we have already pointed out, if at some point in the future the energy or resources become too scarce, not only may social and technological development stop or even be reversed, but the population may also decrease (would enter the ecological path towards zero growth that the authors refer to in the text). It could also happen that development stops at a general level because someone or something other than an energy or materials crisis stops it. Or it could happen... God knows what.

- Evidently, the authors see it as a bad thing that the predicted demographic stabilization will most likely not happen, because this implies that there will not be as much development as is usually expected (the authors see technological and social development as a good thing). And certainly the fact that the "industrial path to zero growth" is probably a myth is a bad thing, but not because as much development as the authors would like is probably not going to take place, but simply because it implies that overpopulation is very likely to continue, getting worse in the near future, with all the ecological (and other) problems that this entails.

- The authors say "It is currently unclear why the contribution of extrametabolic energy to the total energy consumption of industrial humans alters their reproductive patterns, which in naturally fertile populations would follow the rules of energy-based life cycles. ". This is a fairly explicit way, coming from scientists, of recognizing not only that industrial societies modify natural human behavior (although the authors only mention human fertility, this is not the only natural human tendency that is profoundly affected by fertility). techno-industrial society), but also that the amount of energy and resources that is not devoted to maintaining human beings (what the authors call "extrametabolic energy input") tends to be increasing. Where they do not enter is to wonder what all that "extrametabolic" energy that is consumed in industrial societies is dedicated to and that does not end up being dedicated to producing and maintaining greater human offspring. Since the techno-industrial society is a society that generates and consumes energy like no other society and if all that extra energy is not dedicated to human reproduction, logic tells us that it is increasingly being dedicated to the maintenance of the general machinery of the system and of their organizations, especially their non-human parts (production and maintenance infrastructures, management structures, propaganda media and technology in general). The amount of energy required to maintain and develop the techno-industrial system goes far beyond maintaining basic human needs and tendencies (including reproduction), and therefore it is really increasingly about maintaining the system. , not humanity.[b] unstoppable, disappearing most of the physical limitations to its growth (including

demographics). It's unlikely to happen in the relatively near future, but in theory it could happen.

[b] Here we can intuit the fundamental reason why people in more developed societies tend to reproduce less: the consumption of energy and resources that the population needs to maintain and reproduce competes more and more with the consumption of energy and resources necessary to maintain the increasingly abundant and essential parts not

- The authors keep China among the developing countries in the latest data they use (2007). Wasn't China already a developed country in 2007? This gives reason to think about the rigor with which the authors handle and interpret certain data.

- Lastly, the authors, as is unfortunately usual in texts on ecological issues, cannot avoid paying their "tithe" to the prevailing political correctness by shoehorning the issue of inequality between countries a bit into the text. We refer specifically to your comments on the inequality in the use of energy between developed and developing countries and to the calculations you make based on models based on "egalitarian" hypotheses (increasing the availability of energy in developing countries and reduce it in developed countries) that in reality, after all, do not change the results (the total energy available remains the same and insufficient to globally follow the "industrial path towards zero growth") nor do they contribute anything remarkable to their study, beyond allowing them to look good with their peers and progressive scientific circles.

Current demographics suggest that future energy supplies will be inadequate to slow human population growth

By John P. DeLong, Oskar Burger, and Marcus J. Hamilton

Introduction

The global human population has been growing throughout the evolutionary history of humans, from a small initial size to ~7 billion today. The recent rate of global population growth, which peaked in the 1950s and 1960s, is now slowing[270] and many believe that the size of the world population is approaching a steady state. Demographic studies suggest that we can expect a stagnant human population of around 9 to 10 billion by the middle of this century.[2,3] Such projections are made by extrapolating recent trends in vital rates over time. The key phenomenon often invoked is the "demographic transition," which is the reduction in fertility that would accompany the reduction in development-induced mortality.[4,5] In essence, the rate of population growth declines as a result of economic development, which brings benefits that

increase life expectancy and reduce infant mortality.[6,7] Stimulated by these benefits of development, the fertility rate declines until it reaches or even below replacement level .

Economic development requires energy.[7-11] A general idea of the energy-based demographic transition is that an increase in energy use produces an increase in development, thereby causing mortality to decrease and, ultimately, causing fertility to decrease as well. However, most forecasts have assumed that energy inputs are either irrelevant to the demographic transition or that global energy supplies will be sufficient to fuel the economic growth that underlies the demographic transition.[1,3] These assumptions should be subjected to scrutiny, both for empirical reasons and also because they contradict basic ecological theory. We propose that understanding the connection between energy and population growth regulation in humans has the potential to shed light on the mechanisms of population growth regulation in humans.¹

Population growth depends on energy

Energy is related to population growth through its effects on birth, death, and migration rates. When the energy supply increases, populations can grow,² but the energy supply can remain roughly fixed over certain time scales. This latter situation is the basis for much of the classical theory in ecology, which suggests that as a population grows, per capita access to energy decreases, leading to a decline in the birth rate and an increase in the rate of death. mortality, ultimately leading to a stable population size.³ In fact, recent studies show that metabolic rates (ie, rates of energy use) are directly related to birth and death rates.⁴ Most biological populations experience some degree of population growth depending on density, which in turn depends on intraspecific competition for energy from available food,⁵ although other factors are also implicated,

¹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

² Examples:

³ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

⁴ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

⁵ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

such as predation and abiotic pressures.⁶ For our present purposes, we will define the ecological pathway to zero growth as one in which individuals are subjected to energy constraints until birth rates equal death rates. This is the steady state that occurs, for example, in the classical logistic model of population growth.

However, it is important to note that humans use a considerable amount of energy beyond that required to maintain their biological metabolism.⁷ This extra-metabolic use of energy has been increasing over time accompanying economic development.⁸ Extrametabolic energy is fundamentally different from the food energy that constrains the ecological pathway to zero growth in how it is acquired, the amounts involved, and the activities it drives. However, relaxing energy constraints by adding extrametabolic energy to available biological energy stimulates changes in energy distribution patterns such that increased energy use results in fewer offspring. Extrametabolic energy use also increases survival,⁹ so it is possible that a steady state with a high energy level could emerge if there is an intersection of the curves relating energy consumption to fertility and to survival. mortality. The industrial path to zero growth is the path in which the continuous addition of extrametabolic energy to the total energy consumption of individuals drives birth and death rates toward a steady state characterized by relatively large amounts of energy consumption per capita. [twenty]

The demographic prediction of a global population that would stabilize by mid-century is based on the ability of the global population to increase its per capita energy use and follow the industrial path toward zero growth. Said steady state does not represent an ecological carrying capacity. It is a state in which individuals with access to relatively large amounts of energy reproduce only at the replacement level. In this text we ask whether future energy supplies are expected to be sufficient to allow the global

⁶ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*]< em>, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

⁷ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

⁸ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

⁹ For example: “*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*” (*The Earth runs out*, pages 246-247).

population to follow the industrial path towards zero growth. We quantify the empirical relationship between per capita energy consumption and population growth rate and use this relationship to assess how future energy scenarios might affect population size by mid-century.

Results

The population growth rate in humans is strongly and negatively linked to energy consumption per capita (Figure 1A; $R^2=0.44$). The growth rate is zero at 13,131W (95% confidence intervals, 10,590W-21,150W), which means that under current conditions the world population would stop growing if everyone had access to ~13 kW of power, more than 150 times the basal metabolic rate.¹⁰ A similar relationship exists between mean energy consumption and mean population growth rate over time ($R^{11}=0.73$). This pattern is the direct result of the dependence of development on energy consumption and the dependence of fertility and mortality patterns on development in turn. Growth rates decline with per capita energy consumption, because with per capita energy consumption birth rates fall faster than death rates (Figure 1B). The decline in population growth rate with higher per capita energy consumption gives rise to the industrial pathway to zero growth, as noted above, in which individuals with access to abundant energy have replacement fertility.

Figure 1. Relationship between demographic rates (2000-2005) and energy consumption per capita for the countries (2003). **A.** The growth rate decreases throughout the world, with a balance situated at ~13,000W. The solid line is a regression fit of the data ($-0.0058 \ln(Epc)+0.0553$; $R = 0.54$) and the dotted lines are plotted with 95% confidence intervals for the parameters. **B.** Both mean birth rates and mean death rates decline with per capita energy consumption, but birth rates fall faster than death rates, causing the decline in growth rate observed in $< \text{strong} > A < / \text{strong} >$. The fits are: birth rate ($R = 0.67$; equation is: $-0.0074 \ln(Epc)+0.0775$; death rate ($R = 0.19$; equation is: $-0.0015 \ln(Epc)+0.0202$).

Our model shows how variation in the future energy supply can affect the future size of the global population, according to the empirical relationship shown in Figure 1. Specifically, our model suggests that the future energy supply will be insufficient to produce the stabilization of the population at mid-century (Figures 2A and 2B).

¹⁰ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

¹¹ Original title: *The Vanishing face of Gaia*.

We have considered four alternative energy forecasts, based on a recently published specific study of all types of primary energy.¹² These four scenarios, which we have referred to as optimistic, linear, realistic and pessimistic, would all offer, according to current demographic empirical data, insufficient amounts of energy to drive the world population down the industrial path towards zero growth. The optimistic energy scenario is a continuation of the accelerating rate of energy consumption that has been occurring over the last few decades and would exceed the energy supply predicted in any published study, yet even this amount of energy would be unable to do population growth rates dropped to zero.

In the four trajectories generated from the four energy scenarios, we have kept the current ratio for energy consumption constant: 85% in developed countries versus 15% in developing countries. We have then relaxed this assumption and allowed energy distribution to be proportional to population size, so that the developing world, with 82% of the world's population in 2009,³ would use 82% of the world energy. Applying the optimistic energy scenario, this change produces a much slower growth rate, consistent with the UN's intermediate forecast of 8 billion people around 2025, at which point our trajectory departs from the UN's and continues to grow.

How much energy is actually needed to allow the global population to follow the industrial path to zero growth? We have calculated this amount, which we refer to as the UN Implicit Assumption of the Intermediate Forecast of Energy Supply, by breaking down the forecast in each of the countries, both developed and developing, and the determination of the total energy supply necessary to achieve the anticipated rate of population growth. By around 2016, all scenarios suggest that there will be an adequate supply of energy to reach the UN intermediate growth rate (Figure 2A, pink line). After this year, which is much earlier than the expected date for the stabilization of the population size, the global supply does not reach the amount necessary to continue meeting the UN intermediate forecast.

Population growth in the past B

Growth predicted for the past, section 1

Past Predicted Growth, Section 2 UN Interim Forecast

Proportional distribution of energy

Figure 2. Global energy availability and population size in the past and in the future. A. four scenarios encompass the uncertainty about the availability of energy in the future. Stabilizing the population at 9-10 billion requires that everyone on the planet have access to ~13 kW on average, based on current demographics. The amount of energy needed to achieve this (pink line) would be a long way from any forecast of energy supply for the future. **B.** Population growth forecasts for the four

¹² For example: "In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined." (*Earth's Revenge*, page 166).

scenarios of **A**. All energy scenarios are insufficient to raise the global per capita energy supply to a level where the population growth rate is zero and therefore no population stabilization is observed. However, a lower trajectory (yellow dotted line) can be achieved by moving from the current state, in which developed countries consume 85% of total energy, to an equal state, in which the distribution is established for each country in the world according to the number of people at each level of development. Under this assumption, developed countries would use 15% of the total energy supply. For this trajectory, the optimistic energy supply scenario has been used.

The UN's implicit assumption suggests that there will be an increase in energy supply that does not appear to have any historical precedent.¹³ In addition, the UN Interim Forecast calls for the distribution of energy consumption between developed and developing countries to change over time, from a baseline of around 85% consumed in the developed world. today, up to about 75% consumed in the developing world by 2050 (Figure 3). Therefore, the UN intermediate forecast calls for more power than is predicted to be available, and for that power to be distributed very differently than it is today.

Of course, the results produced by our model are sensitive to precision in measuring the relationship between per capita energy consumption and population growth rate, but Figure 4 shows that our main result is robust to estimation error. of said relationship. However, small changes in parameter values can cause the population trajectory to deviate from the observed historical trajectory, as a result of the complex nature of population growth involving billions of people. Matching the growth obtained from the model with the growth observed between 1950 and 1990 has required a small adjustment in the model intercept: going from 0.055 to 0.057 (Figure 2B, growth for the past, section 1). Matching the growth of the model with that observed between 1990 and 2007 has required a similar adjustment: from 0.055 to 0.051 (Figure 2B, growth for the past, section 2). These c parameter settings (see methods) are well within the confidence interval of 0.049-0.062.

Figure 4. Effect of the variation in the demographic growth rate, E_{pc} , in relation to the expected growth of the population. The main relationship is the same as in Figure 1. The growth trajectories, given only for the optimistic energy scenario, indicate that even in the best cases of energy availability, the error in the relationship between the growth rate and per capita energy consumption is not large enough to assume a stabilization between 9 and 10 billion by mid-century.

The negative relationship between energy consumption and population growth rate also produces a negative relationship between global energy supply and global population size in 2050, which is an unusual reversal of the typical positive relationship between resource supply. and population size. This negative relationship is the exclusive signature of the industrial pathway to zero growth (Figure 5) and reinforces the

¹³ "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

idea that the industrial pathway to zero growth is one in which additional energy leads to lower growth rates.

Figure 5. *Negative relationship between global energy supply in 2050 and global population size in 2050.* This negative relationship is the direct result of the negative relationship between the growth rate and per capita consumption of energy that is produced by an industrial pathway to zero growth, rather than an ecological pathway,.

Finally, the model indicates that population growth will occur in both the developed and developing world, with most of the growth occurring in developing countries due to asymmetric access to energy supplies. (assuming that the developed world continues to use 85% of the world's energy resources). This has consequences for the equalization of energy consumption per capita between developed and developing countries. In 1950, per capita power consumption in the developed and developing world was 2600 W and 230 W, respectively (9 times higher in the developed world). By 2007, the gap had grown to 7,200 W and 470 W (15 times larger) and, in the optimistic scenario, the imbalance is predicted to grow to 10,700 W and 470 W (22 times larger) by 2050. The continued growth of the population, coupled with the imbalance in energy consumption between developed and developing nations, sets the stage for continued population growth throughout the world through long-term declines in per capita energy consumption.

Discussion

All attempts to forecast the global size of the human population are subject to considerable and unavoidable uncertainty.¹⁴ For most forecasts, most of this uncertainty concerns the pace and timing of the demographic transition. However, there is also much uncertainty about energy supplies in the future, and this energy would be essential to fuel economic development that would empirically result in the demographic transition. It is therefore essential to understand how patterns of energy consumption affect the growth and structure of the global human population.¹⁵ By explicitly examining this relationship, we have identified an unrealistic main assumption in previous population forecasts. Given the unequivocal relationship between energy consumption and fertility, stabilizing global population by mid-century will require vastly more energy than is currently projected to be available by then (Figure 2A, “UN Implicit Assumption”) . As the population grows, increasing numbers will be needed to bring more and more people into demographic equilibrium. Current average rates of energy consumption across the globe are much lower than the levels required for equilibrium (~ 13 kW).

¹⁴ Page 114.

¹⁵ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

Demographic forecasts assume that the demographic transition will be inevitable and irreversible. We hold that both assumptions are problematic. This is because the demographic transition requires substantial amounts of energy, and if energy supplies decline, then growth rates are likely to increase. The potential for this reversal of the demographic transition follows directly from conventional population ecology theory and the empirical relationship between energy consumption and fertility that we show here. In the event of such a reversal, the growth rate will most likely follow the current relationship between growth rate and energy. It is also possible that a new relationship will emerge as time goes on.¹⁶

The relationship between growth rate and per capita energy use has developed throughout recent human history as human societies have increasingly accessed finite amounts of energy stored in the geosphere, i.e. that is, to fossil fuels.¹⁷ It is not surprising, then, that there are interesting historical and cultural patterns involved in this relationship. Some countries with shared histories, such as the oil exporters of the Arabian Peninsula, have high population growth rates for their level of energy consumption, and others, such as the former Soviet states of Eastern Europe, have low growth rates for their level of energy consumption. of their energy consumption (Figure 1A). Some of this variation may have to do with recent migration patterns and global energy trade networks, and we suggest that further evaluation of historical effects on such relationships could help us better understand these patterns. We also note that variation around the general relationship indicates that there is potential for a reduction in the amount of energy needed to drive the demographic transition.

The drop in population growth rate with increasing energy use per capita occurs because with energy consumption birth rates fall faster than death rates. The way in which energy consumption induces a decline in mortality rates is quite evident: energy is used to develop medical science and technology and to produce and distribute health services,¹⁸ as well as to maintain a growing amount of of increasingly diverse foods that improve people's nutritional status. In contrast, how extrametabolic energy availability induces a change in birth rates is less clear. One possible explanation is that rising costs of raising children in more developed countries force parents to reduce the number of children because it places restrictions on the time and energy available to raise them.[5,18,25] It is currently unclear why adding extra-metabolic energy to the total energy intake of industrial humans alters their reproductive patterns, which

¹⁶ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

¹⁷ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

¹⁸ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

in naturally fertile populations would follow the rules of energy-based life cycles.¹⁹ However, it is clear that understanding the energetic basis of reproductive decisions in humans could contribute substantially to our ability to affect future population growth.

Today, it is widely assumed that the global human population will follow the industrial path towards zero growth.[2,2,28] Our results suggest that the total amount of energy will be insufficient to produce such an outcome, depending on demographic data. current. Other restrictions on birth and death rates could come into play at some point, but this is very difficult to predict at present. Water scarcity, disease, or violent conflict could all play a role in limiting population size, or the population could be constrained by food availability²⁰ and start back down the path. ecology towards zero growth. Our analysis indicates that it is crucial to determine how these limits will play a role, since we could only expect the global human population to follow the industrial path towards zero growth if the energy supply in the future turns out to be much greater than currently predicted and if a better balance between rich and poor nations in terms of access to energy is achieved.

In sum, by not considering the fundamental theoretical and empirical relationship between human reproduction and energy use, current demographic predictions for population growth in the near future are questionable to say the least. Our analysis shows that, if such relationships are considered as rigorously as possible, using empirical data and fundamental principles of ecological energetics, the global human population will most likely continue to grow, because, for any reasonable prediction of the availability energy future, energy constraints will limit our ability to follow the industrial path towards zero development.

Methods

Data

We have extracted data on per capita energy consumption, growth rates, and crude birth and death rates from the World Resources Institute (WRI) National Demographics and Energy Consumption Database[d,]30 Y

[d] “World Resources Institute (WRI)” in the original. *N. de t.* we have fitted the non-linear models to the data to obtain an empirical connection between energy and growth that could be used in the population model. Extrametabolic energy consumption is defined as the total annual energy consumption of a country divided by the size of its population. The IRM crude birth and death rates have only been used to show the intersection of birth and death rates in a single value of per capita energy consumption,

¹⁹ “Sweat lodge” in the original. *N. from trans.*

²⁰ “DNR” in the original. “Department of Natural Resources”. *N. from trans.*

thus illustrating why growth rates decrease with per capita energy consumption. capita and how a high-energy, zero-growth state would exist for humans. Using the IRM data, we have also tested the relationship between per capita energy use and population growth rate over time, in which the growth rate was independently estimated as the mean percent change for each country measured at mid-year. Data for Middle Eastern oil-producing states were excluded as outliers, as they consistently show much higher growth rates than would initially correspond to their energy consumption, and this could depend on how much energy they use. nationwide for oil extraction.

We have created four scenarios for future energy supply, E , ranging from the pessimistic to the optimistic scenario. For the “pessimistic” scenario we use an estimate of the total energy supply in the future from ref. 11, which predicts a continued growth in the main power supply followed by a decline from mid-century onward and is consistent with other estimates.²¹ We suspect, however, that this forecast underestimates the supply from renewable energy in the future as additional energy production would be spurred on as the demand for alternative energy sources becomes greater. Therefore, the “realistic”, “linear” and “optimistic” scenarios foresee future energy supplies greater than those predicted by ref. 11. The optimistic scenario represents energy consumption consistent with that of recent decades. The four energy scenarios for the future are:

$$\frac{dE}{dt}$$

$$-9e712 + 6.8e9t + 1.1e11$$

case 1: pessimistic energy scenario

$$-8e712 - 6e9t + 1.4e11 \frac{dE}{dt}$$

case 2: realistic energy scenario

$$\frac{dE}{dt} = 2e11$$

$$\frac{dE}{dt}$$

case 3: linear energy scenario

$$= 8e712 - 6e9t + 2.8e11 \frac{dE}{dt}$$

case 4: optimistic energy scenario

Population model

In the model, changes in population size are given by rN , [e] where the growth rate $r = f(E_{pc} / \text{sub})$. E is given by future energy scenarios and E_{pc} (energy supply per capita) is calculated as E / N . the function f is given by the N would be the population size. N . from t .

$$\frac{dN}{dt} = E E . . r$$

$= [(a \log(b -) + c) N \frac{dN}{dt} N$ where a, c are adjusted constants and b is the proportion of the global E available to a group. We have divided the global population

²¹ “National forests” in the original. N . from *trans*.

into the developed world and the developing world due to the great imbalance in the use of energy between the two (85% of global energy is consumed in the developed world)²² and the great difference in terms of population sizes (eg, 5.32 billion in the developing world vs. 1.35 billion in the developed world in 2007).²³ Therefore, b is 0.85 in the developed world and 0.15 in the developing world. Global population sizes in year t are expressed as the sum of the population sizes of the developed and developing worlds.

We have applied the model to past and future global energy supply trajectories. The estimated energy consumption for the period between 1950 and 2007 was obtained from ref. 11. The four energy scenarios for the years 2007 to 2050 have been used to produce four energy-dependent trajectories for the population in the future. The initial conditions for 1950 were $E=2.5 \times 10^{24}$ W,²⁵ with a population size in the developed world of 810 million and 1,720 million in the developing world.²⁶ The growth trajectories generated by the model are sensitive to the value of c , and in order for them to correspond to past growth it has been necessary to make small alterations in this parameter. The adjusted value of c is 0.055 (+/-0.07), but the correspondence with the growth pattern of the period from 1950 to 1990 has occurred when c takes the value of 0.057. For the period between 1990 and 2007, a value of 0.051 has generated a coincidence with the observed growth. For years after 2007, the adjusted value of c has been used. To assess the robustness of our overall conclusion from the model results, we have re-applied the model with 95% confidence intervals for the parameters. We have obtained three curves using the scenario of an optimistic energy future which, as we have shown, is the best-case scenario.

We have calculated the scenario for future energy supply implicitly assumed by the UN intermediate growth path by following the steps below. First, we split the forecast into developed and developing countries, taking 2009 as the starting point and 2050 as the end point. Second, we have fitted a linear growth curve to the growth curve of developed countries and a quadratic function to the growth curve of developing countries. The sums of these two curves offer a close approximation to the UN intermediate forecast. For each group, we have calculated the growth rate for each year using $(N_{t+1}-N_t)/N_t$ from the smoothed function. Third, we have solved the fitted equation in Figure 1A for E_{pc} , and used the calculated growth rate to estimate the E_{pc} for each year. Finally, we have multiplied the E_{pc} of each year by

²² “Rat wall” in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

²³ “Rat wall” in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

²⁴ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

²⁵ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

²⁶ A couple of examples:

N_t to obtain the $\langle E \rangle$, the global energy supplies that are assumed to be necessary for both developed and developing nations to follow their respective curves, and then we have added them together to get the total global energy supply needed to make global population follows the industrial path to zero growth. This procedure has allowed us to compare the assumed global energy supply with the predicted energy scenarios, as well as to evaluate the assumption made about the distribution of energy between developed and developing nations.

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When shots backfire: two unexpected consequences of technological revolutions

By Michael Huesemann and Joyce Huesemann[a]

Dependence on modern technology to feed a growing population

The number of human beings has increased from an estimate of 10,000 around 130,000 to 150,000 years ago to about 7,000,000,000 today.¹ While this population increase appears to be exponential, closer analysis shows that the expansion of human populations has actually occurred in several stages in response to changes in climate and a series of three major technological revolutions: the manufacture of tools, agriculture and industrial revolutions. The invention of advanced stone tools during the Upper Paleolithic period allowed hunter-gatherers to spread from their native area in Africa into Eurasia around 40,000 to 50,000 years ago, with the total population increasing to 10 million just on the eve of the the agricultural revolution. The invention of agriculture some 10,000 years ago greatly multiplied the carrying capacity of the earth, resulting in a stabilization and expansion of the food supply. As a consequence, the human population increased to over 100 million about 2,000 years ago.²

The rapid and synergistic development of science and engineering that began more than 300 years ago led to the proliferation of technologies, among which the steam engine, the internal combustion engine and the electric generator stand out. A fundamental effect of the Industrial Revolution was the enormous increase in food production as a result of the industrialization of agriculture, first through the introduction of fossil fuel-powered machinery, which facilitated the rapid conversion of forests and grasslands to farmland, and later by increasing crop productivity through the application of fossil fuel-based fertilizers, pesticides, and herbicides. In essence, non-renewable fossil energy replaced land and labor. As a result of the Industrial Revolution in agriculture, the

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

earth's carrying capacity increased at least tenfold and the number of human beings increased from approximately 545 million 350 years ago to nearly 7 billion today.³

The Industrial Revolution began in Europe around 300 years ago and has since spread throughout the world through intensive technology transfer, initially during colonization by Europeans and more recently as part of attempts to "develop" poor nations. The "Green Revolution" is one of the best examples of such technology transfer. While technological development produced rapid population increases in Europe during the 19th and 20th centuries, technology transfer to "developing" nations has been largely responsible for the current global population explosion.⁴

Human overpopulation has many negative consequences. In general, more people means more problems.⁵ Increasing competition for scarce resources such as land, water, food, minerals, and energy often results in poverty, famine, war, and genocide. As more and more human beings control and exploit nature, current environmental problems such as chemical pollution, species extinction and global climate change are being generated or aggravated. In the end, quality of life is reduced as more people move to urban centers, where they often live in unnaturally crowded, unhealthy, noisy and stressful conditions in the world's "megacities".

It is important to recognize that the three main increases in the world's population were based on improvements in access to energy. When, through technological innovation, people gained access to more energy than had previously been available, food production increased and populations grew in direct proportion to it.⁶ As early hunter-gatherers expanded their ranges, they captured more sunlight in the form of additional plants and animals. The subsequent development of agriculture intensified the photosynthetic conversion of solar energy into food biomass, which had an increasing effect on population size. Today, access to fossil energy has led to increased crop productivity both in terms of land area cultivated and labor invested, fueling the most recent and largest increase in human population.

The fact that fossil energy supplies are non-renewable and will most likely run out in the near future⁷ indicates that the current world population, much of whom depends on fossil fuels for food, will not be able to sustain themselves indefinitely. With the

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

⁷ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation

anticipated decline in the availability of fossil fuels, global agricultural production will eventually have to revert to the farming methods of earlier times, which were more labor intensive and less productive. It is highly unlikely that enough food could be supplied for the estimated 9.5 billion people expected in 2050⁸ without fossil energy inputs, given that the very stability and relatively low population density of traditional agricultural societies was determined by its dependence on the limited but constant contribution of solar energy, which could never be increased, only distributed among farmlands, pastures and forests to supply crops, animal energy and fuel in the desired proportions.⁹

It is clear that the very success of the Industrial Revolution has put human beings in a very precarious situation: unless concerted efforts are made over the next hundred years to voluntarily and significantly reduce the size of the human population, a collapse is inevitable. overall population. This would cause massive human suffering on a scale never seen before.

Reduced adaptation of future generations

For many thousands of generations, the process of biological evolution ensured that human beings were well adapted to their natural environment, thereby maximizing their chances of survival. Until very recently, on average seven out of ten children died before reaching reproductive age, thus ensuring that only the most vigorous, those best adapted to a relatively harsh environment, passed their genes on to future generations.¹⁰ The human environment, however, changed dramatically after the Industrial

period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (The Earth runs out, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out* , page 237).

¹⁰ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose

Revolution, when better nutrition and hygiene increased child survival rates. Furthermore, due to various medical interventions such as immunization, antibiotics, and more recently postnatal and even prenatal surgeries, more than 95 percent of newborns survive to reproductive age in developed countries.¹¹

Several hundred years of industrialization have enveloped many humans in an artificial environment very different from that in which their ancestors evolved.¹² Mutations that were lethal or deleterious under natural conditions are no longer eliminated by early death.¹³ The direction of natural selection has been altered by modern living conditions. Those mutations that were previously lethal and deleterious now accumulate in the population, thereby reducing the ability of the population to survive in more rigorous environmental conditions.¹⁴ For example, since the invention of spectacles, people with impaired vision have been able to greatly reduce the risk of dying from predation or accidents, thereby passing their vision impairment on to subsequent generations.¹⁵ If the technological society were to collapse and glasses were no longer readily available, millions of people would suddenly find themselves severely handicapped. Professor James Crow sums up the consequences:

As effective as natural selection was at eliminating harmful mutations in the past, it is no longer so in much of the world. ... Clearly over the past few centuries harmful mutations have been accumulating. Why don't we notice? Assuming we are like *Drosophila* [a fruit fly], the reduction in viability due to the accumulation of mutations would be 1-2% per generation. This is offset by environmental improvements, which

economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now.' (*The Earth Is Running Out*, page 31).

¹¹ For example: "In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined." (*Earth's Revenge*, page 166).

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

¹⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁵ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

are much faster. . How long can we keep this up? Perhaps for a long time, but only if there remains a social order that allows for continuous environmental improvements. If war or famine forced our descendants back into a Stone Age life, they would have to deal with all the problems their Stone Age ancestors had as well as the mutations we have accumulated since then.¹⁶

Here we encounter another manifestation of the dual nature of technological "progress": as people seek to benefit from life in a high-tech society, their descendants see, generation after generation, their adaptation for survival reduced. under more natural conditions. When future generations are forced by social collapse, temporary or permanent, to live "closer" to nature, they will suffer a substantially higher mortality rate. Since complex civilizations do not persist indefinitely, it is only a matter of time before our descendants will be forced to live again without current interventions. At this point, we can say that millions of people will die due, in some way, to our current way of life.

Grades:

[c] There is an edition in Spanish: "End of the era of cheap oil", *Investigación y Ciencia*, May 1998. *N. of t.*

¹⁶ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

Possible reactions of the techno-industrial system to climate change

By Karagam[a]

The techno-industrial system faces a grave danger: climate change.¹ This system depends on the resources of the biosphere to function. Therefore, the stability of the functions of the biosphere is crucial for its effective functioning. Climate change involves a sudden change in the conditions of the biosphere. According to the October 30, 2021 issue of *The Economist*, it is changing precipitation patterns, water cycles, and will have adverse effects on crop yields. The frequency, intensity and duration of droughts and heat waves are increasing. The great ice sheets of Greenland and East Antarctica are becoming destabilized and this, in turn, makes it easier for medium-sized hurricanes to intensify into powerful storms that cause enormous damage. The sea level is rising and threatens coastal cities. Ocean biodiversity is under pressure due to ocean acidification and sudden change in sea temperatures. Tropical areas are becoming virtually uninhabitable. Massive forest fires burning huge areas are becoming more frequent. All this is happening extremely quickly and is forcing the techno-industrial system's capacity to adapt. This system must either be adapted to Translation by Último Reducto of "Possible Reactions of the Techno-Industrial System to Climate Change", published in Karaçam, on November 20, 2021 [<https://vahsikaracam.blogspot.com/2021/11/possible-reactions-of-techno-industrial.html>][(<https://vahsikaracam.blogspot.com/2021/11/possible-reactions-of-techno-industrial.html>)]. *N. from t.*

to these new conditions by changing itself (its energy infrastructure, the level of consumption of its members, etc.) or else try a desperate move in its *fuite en avant* and take the government of the atmosphere.

The October 30, 2021 issue of *The Economist* dedicates a special report to this dilemma and investigates some possible responses to this urgent threat. *The Economist* represents the ideological orthodoxy of the techno-industrial system. Therefore, following their arguments and suggestions on this topic could help discern the possible reactions of the techno-industrial system to climate change.

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

As *The Economist* mentions, the use of fossil fuels was the most transformative event after agriculture. It supposed a massive growth of the population and the “wealth” of the people. But the secondary effect of this development, the accumulation of CO₂ in the atmosphere, has a role that could be “the end of the show”. Therefore, the governments of the world should embark on a vast project. They should stabilize the weather. In the words of *The Economist*, this project will imply that:

Climate stabilization to flatten the curve of warming will be the result of deliberate interventions in both the economy and nature on a global scale. And it will be maintained, if it is maintained at all, by human institutions through the staggering, and possibly arrogant, obligation to manage the atmosphere for the long term.

The Economist explicitly states that, in order to guarantee the perpetuation of the techno-industrial system, it is necessary to undertake from now on a comprehensive transformation not only at the level of the economic infrastructure, but also of Nature on a global scale. The system must undertake long-term atmospheric management. Other, more traditional responses are also assessed and suggested in the special report, but these assessments always end with either an implicit despair about the shortcomings of “traditional” solutions or a reminder that it is too late to rely solely on these traditional remedies. Let’s review, with *The Economist*, what these “traditional” remedies are.

The most publicized of these “traditional remedies” is that the techno-industrial system should give up its addiction to fossil fuels. Things are not looking good in this regard. Despite the UN global conventions and promises to reduce the consumption of fossil fuels, it increases year after year. According to *The Economist*, “in 1992, 78% of the world’s primary energy - the material used to produce electricity, power movement and provide heat for both industrial purposes and to heat buildings - came from fossil fuels. In 2019, the total amount of primary energy used had increased by 60%. And the fraction supplied by fossil fuels was 79%.” Thus, despite all the promises to “stabilize greenhouse gas concentrations in the atmosphere”, from Rio de Janeiro in 1992 to Paris in 2015, the absolute consumption of primary energy produced by fossil fuels increased by 62! %!

The Economist is desperately trying to appear optimistic about the “new” “alternative” energy sources: wind and solar. He gloats in reducing the cost of wind turbines and solar panels. But there is no sign that wind and solar are replacing fossil fuels. *The Economist* only offers statistics on its absolute growth. “In 2020, the share of global power generated by solar panels grew by 21%, pointing to a doubling every four years. Wind power, which now supplies twice as much energy as solar, is growing more slowly, at 12% a year. These figures only represent the absolute growth of solar and wind energy production; they are normal given the ever-increasing energy hunger of the techno-industrial system. They do not indicate that wind and solar energy are replacing fossil fuels. As can be seen in the following graph,[b] the energy consumption in absolute numbers increases for all sources. In the graph, the trend for traditional biomass (firewood, agricultural by-products and manure burned for cooking and heat-

ing) is illuminating. It is the source of energy that human beings have been using since the use of fire was discovered. But as we can see in the graph below, it has not been replaced by coal or oil after the industrial revolution. It continues to be consumed at its maximum level. When it comes to energy supply, one energy source is not a substitute for another. As long as energy is available, the techno-industrial system adds one source to the other and increases its total energy consumption. This is and will be the case of solar energy, wind energy and other "alternatives"; they will add to (increasing) total energy consumption without replacing fossil fuels (which still make up the gross majority).

Our World in Data traditional biomass

It is clear that fossil fuels will continue to be burned for the foreseeable future and that the absolute consumption of these fuels has not yet peaked. *The Economist* suggests putting a price on carbon emissions as a remedy. Carbon pricing would artificially raise the cost of fossil fuel power generation and make it more expensive than solar and wind. This is nothing more than a pipe dream. Applying this strategy with the speed and forcefulness necessary to drastically cut emissions in the required time is practically impossible without shaking the foundations of the system. It would lead to an economic collapse, a huge drop in living standards and an extreme reaction on the part of

[b] For technical reasons only a simplified translated version of the actual graph is shown here. The full graph can be seen in the original article or at: [https://ourworldindata.org/grapher/global-energy-substitution?country=~OWID_WRL][https://ourworldindata.org/grapher/global-energy-substitution?country=~OWID_WRL.] *N. t.* of the population. Much more timid politicians have met with angry reactions of late.

In addition to carbon dioxide, there are other greenhouse gases: methane (from the natural gas industry, landfills, and farming), nitrous oxide (mainly from agriculture), and industrial gases that contain chlorine. . Once again, there is no hope of a timely solution to these emissions. "Large reductions in agricultural emissions of methane and nitrous oxide will take time," says *The Economist*. Apparently, the recent propaganda campaign in favor of veganism is not giving the expected results.

Another problem is "sulfur dioxide emissions, associated above all with the burning of coal and heavy oil." The burning of coal and heavy oils produces tiny sulfate particles in the air, which offset the warming from the greenhouse effect. Therefore, reducing coal consumption would aggravate climate change in the short term. The system is here caught in a dilemma.

In Paris in 2015, governments made pledges to voluntarily reduce CO2 emissions, the so-called "nationally determined contributions (NDCs)". CDNs are not binding agreements and there is no regulatory power to ensure these promises are kept. They

are castles in the air. But even if they were met, these commitments would not be enough to limit global warming to 2°C, let alone 1.5°C. “Even in Paris, it became clear that the 1.5°C limit could not be achieved only by reducing emissions. This would have to be complemented with something else: the removal of CO₂ from the atmosphere through ‘negative emissions’”. Yet again, despite all the hype about the need for negative emissions, there is currently no effective method of achieving it. “Mechanisms that can provide large, reliable CO₂ removal remain embryonic at best,” laments *The Economist*. We will return to this later.

In addition, there is “the problem of Asia”. More than half of the world’s population lives there, and Asian countries constitute a large part of the so-called “developing countries”. They aspire to raise the standard of living of their citizens; something that can only be done by increasing energy consumption. In addition, these countries have a growing population. They have to grow economically to integrate the new generations into the economy. Otherwise, they could face economic crises, mass unemployment and social instability. *The Economist* says that “two-thirds of the world’s coal is produced there” and “Asia produces most of the world’s cement and steel.” As if it were a vice exclusive to Asian countries and the developed countries of Europe and North America, they had gotten rid of this unpleasant habit of coal, cement and steel. But this is very far from reality. If the developed countries seem “better” in that sense, the reason is that they mostly moved their manufacturing sectors to Asia to reduce production costs. They have exported emissions, but their economies remain dependent on coal, cement and steel.

In this special report, we witness the internal debates within the system about capitalism and degrowth. Third wave leftists,² like Naomi Klein, claim that it is impossible for capitalism to divest itself of fossil fuels. Since capitalism is driven solely by profit, the fossil fuel industry will insist on putting its profits before the threats of climate change. Therefore, to get rid of fossil fuels, you need to get rid of capitalism. Like good first-wave leftists, the writers of *The Economist* refute this claim. According to them, to reduce dependence on fossil fuels, new technologies and new investments are necessary. And capitalism has proven to be the most successful economic system in providing both. “The only thing that is needed is to find a way that growth does not have to be linked to the increase in CO₂.” *The Economist* uses the following formula to demonstrate the relationship between development, energy and CO₂ emissions.

$$\text{CO}_2 = \text{population} \times (\text{GDP per capita}) \times (\text{energy} / \text{GDP}) \times (\text{CO}_2 / \text{energy})$$

According to this formula, to reduce CO₂ emissions, it is necessary to reduce either the population, or GDP per capita, or the energy used per unit of GDP, or the carbon emissions of that energy. *The Economist* explains that population reduction through a long-term strategy “is not a course of action that governments can pursue efficiently and politely”. We agree with it. First, it is impossible to carry out long-term population size monitoring globally as a concerted international effort. Second,

² Original title: *The Vanishing face of Gaia*.

as long as the system requires massive human labor for its functions, controlling the size of the population will be detrimental to the economies of the different countries. As we have seen in China's one-child policy, in addition to causing problems such as destroying the balance in the population's sex ratio, controlling population size greatly increases the dependency ratio.[c] The increase of the dependency ratio has enormous adverse effects on the economic performance of a country. For these reasons, as well as the impossibility of a concerted international population size control effort, individual countries will also fail to pursue a drastic population size control strategy that is fast enough to curb CO2 emissions at weather.

And the GDP per capita? It has increased enormously since the Industrial Revolution thanks to the concentrated energy that humanity obtained from fossil fuels. As *The Economist* also mentions, if GDP per capita continues to rise, improvements in energy efficiency and carbon intensity[d] would only keep carbon emissions stable. So is it necessary to lower GDP, push back growth, to save the system from climate change? *The Economist* gives several reasons why it would be impossible to apply degrowth consciously and following a strategic plan. These reasons are not wrong in and of themselves, but they do overlook the fundamental and underlying causes that make it impossible to apply these types of comprehensive long-term plans. But let us first look at the reasons *The Economist* gives to explain the impossibility of such an action:

1. To effect a long-term growth reversal, everyone (ie the entire human population) would have to be convinced to consume less. Anyone with a modicum of common sense will know that this is impossible. Therefore, governments should apply a dictatorial policy to ration the consumption of their citizens. However, as *The Economist* puts it, "a policy that openly advocates deliberately slowing, halting or reversing long-term growth,

[c] The dependency ratio is the proportion of the population between 0 and 15 years of age or over 65 years of age, that is, children and retirees. *N. from t.*

[d] Carbon intensity or emissions intensity is the rate of emission of carbon dioxide during industrial activities. *N. of t.* even if it is presented as being for the good of the world, it is a very unpromising platform to win elections". It seems from this quote that only "democratic" countries would have problems rationing the consumption of their citizens. However, while human labor is necessary for the economy to function, authoritarian regimes will also need to seek the consent of their populations. In today's world (where humans live in a modern zoo, cut off from their natural habitats), consent is achieved primarily through consumer possibilities (electronic gadgets that isolate people in a virtual world to make them forget their grim existence, the search for merchandise that offers people a pseudo-purpose in this meaningless world, etc.) that require growth. In the short term, which is the period in which a response to climate change would have to be given, massive human work will continue to be necessary for the system to function. Therefore, it would be impossible to play the degrowth card, since it would greatly affect the standard of living of the masses.

2. Decarbonization can only be achieved through massive investment in renewable energy.³ This is especially true for emerging economies. Much of the investment needed to build new “renewable” energy infrastructure must come from developed countries, and without growth there will be no incentive for investment.

3. The decarbonization process will require accelerated innovation. As an economic system, capitalism is the one that has best known how to promote innovative ideas and apply them on a large scale. The system will need that characteristic of capitalism. According to *The Economist*, reducing CO2 emissions will require “better ways to store energy, to heat homes, to cool them, to process crops, to grow crops, to power large vehicles, to produce plastic and more”. This cannot be done in the framework of a “shrinking economy, low demand and low investment”.

The reasons *The Economist* gives to explain the impossibility of planned degrowth overlook the more fundamental reasons. First, it is impossible to direct the development of a complex system - especially a system as complex as the global techno-industrial system - by devising a long-term plan and applying it in real life. Complex systems are made up of numerous components. It is impossible to know the infinity of relationships between these components; how they affect each other in feedback loops that reinforce each other. The planned decline would require a long-term plan that should be applied globally. It would be necessary to know the consequences of this plan in the global system and this is impossible. There will always be unforeseen consequences of actions taken to achieve the planned goal. Furthermore, the objective or determination of the actors undertaking this plan may change over time, and even the actors themselves may change or disappear.⁴

The other reason that makes it impossible to implement degrowth in the long term is the existence of “self-propagating systems”.⁵ A self-propagating system is a system that tends to promote its survival and propagation either by increasing its size and/or power indefinitely,⁶ or by giving rise to new systems that possess some of its own attributes, or by doing both. Nations, corporations, unions, churches, political parties, mafia organizations, etc., are all self-propagating systems. The Darwinian selection processes that work in biology (natural selection) also operate in the environments where these systems are present. This selection process favors self-propagating systems that have the characteristics most conducive to self-propagation. As a result, these

³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

⁵ The “Earth sciences” or “geosciences” are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

systems tend to propagate and push out or absorb other self-propagating systems that do not have these characteristics. They are in constant “competition” with each other. This competition is not so much a deliberate antagonism as an unconscious process. Self-propagating systems that expand their functions by incorporating more energy and matter into their metabolisms will increase their material power; therefore, they will absorb or bypass other self-propagating systems. Therefore, a voluntary degrowth strategy would be a sure recipe for disaster for the systems that apply it. They would give up the advantage to systems that relentlessly seek their growth and expansion by absorbing more energy and materials every day. Systems that applied degrowth would be eliminated, eaten, or cast aside.

We find the discussion of capitalism and all the fuss third wave leftists are making about it to be meaningless. First of all, it is not clear what exactly they mean by “capitalism”, but it seems that they imply an economic system designed, created and managed by some selfish and greedy people (financial speculators, big oil companies, the 1%, etc.) who try to maximize your benefits no matter what. But “capitalism” is not something consciously designed, created and managed. The things that are generally associated with “capitalism” (financial instruments, modes of ownership, social classes, economic theories, etc.) have developed during the evolution of complex human societies. They are not consciously designed and implemented by anyone to achieve a defined result. They are the result of the Darwinian selection process that operates in human societies. Those properties that are most conducive to the growth/development of a society end up being selected by this blind selection process. And the phenomena that are generally associated with “capitalism” arose through this process. They developed and spread globally with technological advances and the consequent increase in the complexity of human societies. By pointing to “capitalism” as the main culprit, as if it were consciously preferred and deliberately maintained by some people, and therefore can be eliminated and replaced by the decision of some other people, they divert attention from the real problem: the existence of capitalism. a highly complex human society that is based primarily on material conditions (energy and material resources, the technological infrastructure that makes use of these resources, and the resulting consequences on demography, ecosystems, etc.), not on property relations, class structure of society, financial speculation, greedy oil businessmen, etc. Furthermore, despite their endless rhetoric about alternatives to “capitalism”, it is impossible to hear any alternatives from them. Apart from the already tried and abandoned command economies of the socialist countries, what is the alternative to “capitalism”?

In summary, according to *The Economist*, the techno-industrial system is not capable of effecting a change in the first two variables (population and GDP per capita) of the aforementioned CO₂ equation. Control of population size is impossible. It will continue to increase until the middle or end of the century and will continue to be a factor in increasing CO₂ emissions, not a factor in decreasing it at all. Applying a degrowth strategy and reducing the second factor is also impossible for the techno-industrial system. On the contrary, growth is necessary to deal with climate change.

Given that the techno-industrial system cannot disconnect itself, in order to curb its effects on the earth's atmosphere and save itself from the sudden changes that these will cause, it will have to implement a colossal transformation in its energy infrastructure. This transformation will require accelerated technological development and the application of these new technologies on a global scale. The only way to carry them out is investments and economic growth. The "world of gigawatts connected to a network of giant turbines and solar parks" should spread throughout the environment. Technological progress should find remedies to the problem of intermittency (wind turbines and solar panels cannot work in inadequate wind or cloudy weather, respectively). But, these "traditional" remedies will not be enough to limit the effects of climate change to acceptable levels for the system, at least in the period that is needed. Therefore, something more is necessary.

An option for that "something else" are the so-called negative emissions. The following figures given by *The Economist* demonstrate the need for negative emissions for the system: "The total share of CO₂ emissions corresponding to a 50% chance of meeting the target of 2° warming C is 3.7 trillion tons. The quota for a warming of 1.5°C is only 2.9 trillion tons. With 2.4 trillion tons already emitted, at the current rate there is a decade of emissions left to raise the temperature by 1.5°C, perhaps 25 years to reach 2°C". This means there is no way out. If the system manages to find a way to absorb some of the CO₂ already emitted, it will be able to buy more time to change or adapt to climate change. There are various methods proposed to try to achieve "negative emissions". But most of them, like direct capture in the air or increasing the alkalinity of the oceans by adding lime to increase the rate of dissolution of carbon in seawater in the form of carbonate ions, are right now science fiction. and fantasy. Furthermore, they would create more problems than they would solve: they would require massive amounts of energy to apply and would have unforeseen adverse effects on ecosystems.

A more plausible negative emissions method for the system would be biomass energy with carbon capture and storage (EBCAC).[e] Plants that capture carbon from the atmosphere through photosynthesis would be burned in power plants as fuel and resulting carbon emissions would be captured and stored. Negative emissions scenarios from climate models (such as those of the United Nations IPCC) are based on this method. But it is easy to imagine the enormous dangers that this method would pose to Nature. As *The Economist* also mentions, "its large-scale deployment requires huge amounts of land to be devoted to energy crops: according to some estimates, an area equivalent to up to 80% of what is already It is used for food crops. If the growing energy demand of the techno-industrial system is taken into account, the area needed to cultivate the plants that are burned in power plants would only grow. Large tracts of wild ecosystems, such as forests and grasslands, would be turned into industrial plantations of fast-growing trees. As this method would have a "green" and "sustainable" image, it would be carried out with greater impunity and even with the pretense of restoring "nature". In fact, according to *The Economist*, this has already happened

in Chile: “In Chile, government grants helped establish 1.3 million hectares of tree plantations beginning in 1986, but no applied a rule

“ Biomass energy with carbon capture and storage (BECCS)” in the original. *N. t.* that demanded that this expansion not be done at the expense of native forests. As a result, the program actually reduced the amount of carbon stored by about 50,000 tons.” But even the large-scale deployment of the EBCAC does not seem promising enough to solve the problem that climate change poses for the system in time. The area required for large-scale deployment is too large. The system needs your farmland to feed its huge population. As the example from Chile above demonstrates, if tree plantations were to replace wild forests, the net result would be more carbon in the atmosphere, just the opposite of the negative emissions program targets.

The other possible reaction, and possibly the most dangerous for Wild Nature, is that the techno-industrial system tries to “rule the atmosphere”. As we said, *The Economist* represents the orthodoxy of the ideology of the techno-industrial system. In this special report, the chain of argument implicitly points to “governance of the atmosphere” as the best (or even the only) possible option to “fix” climate change in the short term in which it must be dealt with. Geoengineering remains controversial; there are many uncertainties about its consequences, about who has the authority to apply it, etc. That’s why we don’t (yet?) see a brazen defense of geoengineering in this special report or in the media in general. But we see that it is being mentioned more and more as a possible option and the fact that a magazine like *The Economist* defends it and proposes it as a solution shows us where the trend is heading.

There are several proposed geoengineering methods, but the most popular and the most studied in models is solar geoengineering: spraying reflective particles into the stratosphere so that they reflect sunlight back into space and create a cooling effect that offsets the greenhouse effect of the sun. CO₂ in the atmosphere. According to *The Economist*, geoengineering is cheap, “it seems likely that veiling the atmosphere would be comparatively cheap” and could be carried out “with a relatively small fleet of purpose-built aircraft”. *The Economist* believes that the application of a solar geoengineering program implemented through international cooperation is the miracle solution. If the world as a whole could come together and apply a solar geoengineering program collectively, this would provide “climate benefits to almost everyone and serious problems to almost no one”. It would give the system some breathing room to adjust its energy infrastructure according to the circumstances. And when the CO₂ level was low enough, “governance of the atmosphere” would gradually be removed, leaving behind a stable climate.

Of course, this optimistic scenario of “fixing” the climate ignores some crucial and insurmountable obstacles that such an undertaking would inevitably face. Even if we assume that the whole world comes together and launches a global solar geoengineering plan, we can be pretty sure that the consequences of such a plan would be very different from what was expected. Earth’s atmosphere is a complex system. We don’t know exactly how it works and we don’t know the feedback loops between its compo-

nents and the relationships it has with the rest of the biosphere. Our models of the atmosphere or climate are not reality itself, but an approximation and simplification of it. When the atmosphere begins to be manipulated, there will inevitably be unforeseen consequences. To mitigate the effects of these unforeseen consequences, further adjustments will be necessary. And this process will continue in a self-reinforcing feedback loop until the natural mechanisms that keep the chemistry of the atmosphere and climate within certain limits break down. When that happens, the stability of the Earth's atmosphere and climate will depend on the artificial control of the techno-industrial system. In an eventual collapse of the techno-industrial system, the artificial control of the atmosphere would cease and its composition could reach a state in which it could no longer support complex living organisms.

On the other hand, mitigating the effects of climate change with artificial cooling from geoengineering would ease the pressure to reduce CO₂ emissions. The techno-industrial system continues to depend essentially on fossil fuels for its energy needs. With an artificial method to suppress the effects of burning fossil fuels, companies and governments would increase their CO₂ emissions with greater impunity. That, in turn, would create the need for a more intense intervention in the atmosphere, and so on.

But solar geoengineering will most likely not be carried out as a globally concerted collective effort. It is unlikely that all the governments of the world will come together in concerted action to implement such a plan. Solar geoengineering will have different effects in different countries. Some will oppose such an attempt, others will be reluctant, and others will want immediate implementation. They will have different ideas about how to apply it. Since geoengineering is relatively cheap to apply, a more eager country or group of countries might choose to implement it on their own and could do so with their own resources. As we have said, we cannot know in advance the precise consequences of geoengineering. A possible consequence would be the change of the water cycles. Countries that unilaterally apply solar geoengineering would choose to pursue primarily their own benefit; they could cool one part of the planet while altering the water cycles in other parts, producing negative consequences for other countries. That could provoke retaliation in the form of more solar geoengineering and the chemistry of the atmosphere could be devastated more quickly with each country playing with the atmosphere for its own benefit. In any case, regardless of how it is carried out, "governing the atmosphere" would represent the most complete attack on the autonomy of wild processes.

The techno-industrial system is in an incessant flight forward. Its operation creates disturbances in the processes of the biosphere. But because it continues to depend on Wild Nature for its existence, these disturbances also pose threats to its effective functioning and survival. To mitigate these effects, palliatives are invented in the form of technological fixes. But these technological solutions end up creating deeper problems. In its hasty flight from the problems that its own existence generates, the system becomes more complex, larger and more voluminous. Its disturbing effects on biospheric processes are becoming more intense, destructive and numerous. Climate change and

the system's reactions to it are a sample of this process. The techno-industrial system has already ruined and continues to ruin the environment and wild ecosystems with wind turbines and solar panels in its quest to adapt its energy infrastructure to climate change. It has caused enormous damage with the mining operations necessary to obtain the metals needed to produce wind turbines, solar panels, electric batteries, etc. He plans to convert massive areas to industrially produced tree plantations to feed his insatiable hunger for energy with more "sustainable" methods. But all this is not enough for you to be able to adapt in time to the new climate that you are creating. Therefore, it is preparing to attempt the most daring of its endeavors: "control the atmosphere." Apart from its complete destruction, nothing will stop it; its forward flight will only continue with accelerated speed and will devour the remaining autonomous savage processes.

Grades

1. Climate change is also a serious danger to wild ecosystems. But, in this text, we try to examine the question from the perspective of the system to outline its possible reactions. The likely solutions that the system engineers will mostly pose more dangers to wild Nature.

2. For a more detailed discussion of the development of leftism (first, second, and third wave leftism) and its role in the system, see [<https://drive.google.com/file/d/1pzXh5DzMs0H3zG9GOBMOh9lwp9eBu2M0/view?usp=sharing>][Karagam, "Leftism,][<https://drive.google.com/file/d/1pzXh5DzMs0H3zG9GOBMOh9lwp9eBu2M0/view?usp=sharing>][Techno-Industrial System, and Wild Nature".]

3. As long as you want to keep the techno-industrial system alive.

4. For a more detailed discussion of the impossibility of controlling the development of society, see the first chapter of *Anti-Tech Revolution: Why and How* by Theodore John Kaczynski (Fitch & Madison, Second Edition, 2020).

5. For a more detailed discussion of self-propagating systems, see the second chapter of *Anti-Tech Revolution: Why and How*.

6. With "power", we do not necessarily mean the exercise of authority over people or organizations. We refer to the material capacity: the geographical extent of the functions of a given system, the ability to control the flows of energy and materials and their magnitude.

[f] There is a translation in Spanish: "Izquierdismo, technoindustrial system and Wild Nature" in Indomitable Nature [<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del-sistema-tecnoindustrial/izquierdismo-techno-industrial-system-and-wild-nature>][(<https://www.naturalezaindomita.com/textos/critica-de-la-civilizacin-y-del->)[<https://www.naturalezaindomita.com/textos/critique-of-civilization-and-the-techno-industrial-system/leftism-techno-industrial-system->

and-wild-nature][techno-industrial-system/leftism-techno-industrial-system-and-wild-nature)].

Presentation of “How We Made Things Worse

The following text, like many others published on this page, has both valuable aspects and flaws.

Among the first, which are the ones that lead us to publish it, would be:

- That it serves as a source of data and scientific references about the ecological situation of the planet (see the notes).
- That criticizes overpopulation, one of those facts that many prefer to ignore.
- That criticizes the anthropocentric arrogance and collective egoism of our species.
- That criticizes the overvalued hypothesis of "biophilia" (from, in certain cases, overvalued author EO Wilson).

Regarding all these aspects, the text offers unconventional points of view that invite reflection.

Among the seconds (the defects), would be:

- Make it clear that climate change is the main threat that we currently face as a species on a planetary level. It is actually important and serious, but it is not the most serious danger today.
- Making the typical mistake of most ecologists: *mixing* social and human problems with ecological problems, for example, proposing international cooperation to end hunger as palliatives for climate change, providing shelter homeless people and divert military spending towards peace initiatives or base our actions on compassion for other beings, human or not. It may be that sometimes the ecological and the social have a certain relationship, but they are not the same, nor are they solved in the same way, nor are the solutions to one and the other -when they exist- always compatible.
- To affirm that “no other species has [enough] conscious capacity [to manipulate the environment and adjust it to their needs]”, something that is not true. We are not the only species that manipulates its environment and adjusts it to its needs (often the difference is only one of degree), nor are we capable of doing so as consciously as we like to believe.
- Consider that in today’s techno-industrial society there is a “capitalist desire for personal control” (capitalist individualism, so vaunted and reviled by progressives) when in reality we live in one of the most collectivist social systems in history, in which individuals and small groups live almost completely subjugated and dedicated to the “common good”, that is, to the maintenance and development of the social system.

- Shopenhorn vivisection into the text. It is not that what the author says about it is not true, it is simply that it is irrelevant and inconsequential at an ecological level.

- Consider that the cause of the current problems is "Baconian science". The so-called "Baconian science", applied science, engineering or technoscience is the predominant way of understanding science today. According to this utilitarian way of understanding the scientific method, its purpose and reason for being is exclusively or mainly its application to the resolution of practical problems, that is, to technological development. According to this, science is and must be a practical tool to transform and control Nature and the world in general. This is certainly a very widespread, mistaken and harmful way of understanding science, which in practice means that at a popular level it is generally identified with technology. However, no idea, however wrong and harmful it may be, is the fundamental cause of today's ecological problems. The cause is always the previous material conditions; ideas at most reinforce (through positive feedback loops) the social dynamics that cause or aggravate said problems and that are generated by said material conditions.

- Make detailed forecasts of what will happen in the future. As we have said on other occasions, complex systems and processes (like climate change in this case) are largely intrinsically unpredictable.

- Give excessive importance to the avoidance of suffering. Suffering is not always so bad, nor is suffering the main evil to avoid.

- The literary farting of the author, citing classic literary works right and left without this contributing anything useful to the understanding of the text.

However, there is an ambivalent aspect that should be highlighted separately: the author's commitment to a pessimistic philosophical position. On the one hand, the author's pessimistic attitude has its share of truth and interest. Pessimism, understood merely as considering that reality and its likely future evolution are not going well,[a] is *not necessarily* incompatible with objectivity and truth. In fact, today it is often quite the opposite: being realistic, lucid, taking the facts into account, implies, if you have certain values, recognizing that many things are going wrong and *probably* will. to worst. Too often, at least today, optimism, understood as having the impression that things are going well and will get better, is nothing more than either ignorance or a stubborn and cowardly denial of the facts. When reality is a disaster, when things are bad, you have to admit it, even if it certainly implies being pessimistic.[b] And this, in principle, has nothing wrong with it. In fact it is the first step to find a solution, if there is one. If it is not recognized that there is a problem, that is, something is wrong, the solution will not be sought. And if the solution is not sought, it is highly unlikely that it will be found.

Often, however, the notion of pessimism is not limited to having an impression that things are bad and are likely to get worse. Often this impression is caused by subjective psychological states that are not exactly healthy. So pessimism is generally associated with a defeatist, depressive attitude, of surrender,

[a] Regardless of what is meant by “good” and “bad”, what is considered “good” and what is “bad”.

[b] Admittedly, this is a simplification, since adopting an optimistic or pessimistic stance towards reality depends not only on whether one is realistic or not, but also on values (notions of what is good or bad). the bad) that one possesses. The same fact can be clearly accepted as real by two people and yet be valued positively by one of them and negatively by the other, depending on the values that each of them possesses. What is a blessing for some can be a curse for others. Here, for brevity, we have assumed that the values are the same for both optimists and pessimists, which, while sometimes largely true, is not always true. impotence, weakness, despondency, despair, discouragement. But in reality, pessimism, understood merely as having a negative assessment of reality, is not necessarily at odds with hope (in the sense of believing that there may be a solution or way out of problems), a fighting attitude, tenacity, the desire to face problems and solve them, etc. Pessimism is not necessarily negative (just as optimism, contrary to popular belief, is very often not positive at all[c]). Or put another way and in a few words: although a depressed and unhealthy psychological state often generates a pessimistic posture, pessimism does not necessarily always imply a depressed and weakened psychological state. There can be healthy pessimism, just as there can and often is unhealthy optimism.

Unfortunately, it seems that the author’s pessimism is not always limited to acknowledging problems and pointing them out. Rather, often throughout the text, the author seems to be pessimistic not so much and not just because he is realistic, but because his psychological state leaves something to be desired: you don’t know well if you see things as bad just because they are really bad. or if he sees them as bad, especially because he feels bad (depressed, dejected, discouraged, etc.).

How we make things worse[d]

By Nicholas P. Money

The decline of our species is the natural and inevitable effect of inordinate grandiosity. The story of its downfall is simple and obvious; and instead of wondering why humanity is being destroyed, we should rather be surprised that it has survived for so long.¹

The fact that we have created the conditions on Earth that will hasten our decline is undeniable. Here are the circumstances: the Earth is heating up rapidly; sea water is becoming acidified and saturated with plastics; industrial activity is poisoning the air; deforestation is incessant; prairies and lakes are shrinking as deserts expand; and a swarm of 10 billion human beings will vie for the remaining resources in 2050.² In

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

the near future, extreme weather events will become more frequent; many crops will be withered by droughts; the fishing grounds will be depleted; stocks

[c] Optimism is very often also associated with states of psychological weakness similar to those usually associated with pessimism. It is simply a desperate way of reacting to the psychological discomfort generated by the events: flee from it or try to annul it with fantasies and false hopes.

In fact, the author, after painting a dark and bleak picture in the text, ends with a suspicious glimmer of "hope" that smacks too much of despair: "And who knows, if we behave better, things may go on for longer than we thought." In the same way, and with a similar purpose, it could have told us about the second coming of Jesus Christ or about an imminent alien invasion.

[d] Translation and adaptation of chapters 9 and 10 ("Greenhouse. How We Make Things Worse" and "Grace. How We Should Leave") from the book by Nicholas P. Money, *The Selfish Ape: Human Nature and Our Path to Extinction*, Reaktion Books, 2019, pages 92-110. Translation and adaptation by Último Reducto. Copyright © Nicholas P. Money 2019. *N. of. t.* of the largest wild animals will continue to dwindle; insect populations will follow in their headlong decline; many plant species will perish and the microbial majority of living things will vanish without even being seen.³ On a somewhat longer time scale the coastlines will change their shape due to sea level rise.⁴ As the Antarctic ice breaks away and dissolves, Florida and Bangladesh will vanish beneath the waves. These planetary changes may have been imperceptible to you up to now and it seems possible that the circumstances in which you live will continue for the next few decades. After all, wealth is the most reliable cushion for cushioning many of life's demands. However, even the nobility should consider the ecological future before having children.

The unfolding story of Earth's destruction has involved some notoriously evil corporations, yet everyone is to blame and the climate apocalypse was stamped into our genes from the moment we left the Rift Valley.⁵ We share our drives to eat and reproduce with mice and mushrooms, but unlike other organisms, the unfortunate fact of having high brain power has allowed us to eat and reproduce in ever-increasing numbers. In addition to the environmental impact due to the number of people, the luxuries of modern life multiply the planetary damage. Most of us want to live like royalty, and as opportunities arise, we have an understandable tendency to try to make

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

our lives more comfortable. These advantages have been achieved at the cost of the gaseous composition of the atmosphere, thickening the blanket of carbon dioxide and trapping the sun's heat on the Earth's surface. It is not possible to say for sure how far we will burn the planet, or how fast we will heat it, but we are making it get hotter.

My brother-in-law from Texas doesn't care about evidence. He cites the Medieval Warm Period and takes solace in the writings of various eccentrics who deny the alarming correspondence between carbon dioxide emissions and average temperatures. His view is widespread in the United States, where white citizens in particular are unaccustomed to the idea that "life, liberty, and the pursuit of happiness" could be compromised. In many other parts of the world, the cause of hotter summers is overlooked by people who are too busy trying to survive to worry about invisible gases.

I write this with deep humility, as someone who is contributing to the end of civilization, driving short distances instead of cycling, traveling on international flights and buying strawberries from South America in indestructible plastic containers. Not that I voluntarily live in a tent, but in my defense I will say that I probably have a lower carbon footprint than most of my neighbors. As a stepfather, rather than a biological father, he would have to go to work in a coal-powered Learjet[e] to cause the same damage as anyone who has donated sperm or eggs to a new generation.⁶ The biggest contribution an individual can make to reducing greenhouse gas emissions is to be dead. And if not, the second best thing is to refrain from making babies.

Thomas Malthus was the first to recognize the danger of unlimited human replication in his *Essay on the Principle of Population*, published at the dawn of the

Mark of jet aircraft normally used as private *jets*. *N. from t.*

Industrial Revolution.⁷ His interest centered on the possibility of mass starvation taking into account the geometric increase in the number of mouths. This diagnosis of the human condition was borne out by the Irish potato famine in the 1840s, but land development, the introduction of fertilizers, herbicides and pesticides, and the mechanization of agriculture - all dependent on fossil fuels - gave us a false sense of security in the 20th century. Along with advances in medicine, the explosion in agricultural production has allowed the human population to quadruple in the last hundred years.

In public discourse, the relationship between population growth and environmental degradation is downplayed. Politicians never touch on this subject, and the kind of doomsday scenario posited by Paul R. Erlich in his 1968 bestseller, *The Population Bomb*, is regarded by most famous intellectuals as insane.⁸ Contemporary economists

⁶ A couple of examples:

⁷ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial

are more concerned with the declining populations of developed nations than with the growing number of human beings in the rest of the world. Even the most prominent environmental activists ignore the population in their pronouncements in favor of sustainability, as well as in their personal conduct. Al Gore, 45th Vice President of the United States, is the father of four children and his partner in politics and activism, Robert F. Kennedy Jr. added six children to his legendary clan. More than a badge of honor, having many children in the 21st century is an act of environmental terrorism. Every hour fifteen thousand children are born and only 6,000 people die; the calculations do not predict a favorable future.

Humans are not the only organisms that have had an impact on Earth's habitability. Microbes and plants changed the chemistry of the atmosphere long before we came on the scene. Bacteria kicked off a momentous change 2.3 billion years ago when they began flooding the air with a noxious gas called oxygen. Microorganisms that for the first billion years had lived happily breathing iron, sulfur, and nitrogen were decimated by this highly reactive and DNA-damaging molecule. As oxygen levels rose, metal breathers and their relatives retreated to seafloor mud and other oxygen-free places. New life forms evolved to take advantage of the peculiar new conditions and found a way to use oxygen to get more energy from their food, which is why we breathe deeply today.

Much later, after life had crawled out of the sea to the Earth's surface, the gases in the air changed again in line with the abundance of plants. Giant horsetails[f] and clubmosses[g] that thrived in the lush forests of the Carboniferous period were spared decay and pressed into seams of coal.⁹ This custom of burial without degradation was so effective in extracting carbon dioxide from the air that it caused global cooling. We release that carbon again every time we get electricity from a power plant that burns coal to send photons vibrating from light bulbs with the same wavelengths that were absorbed by prehistoric forests. Energy in and energy out, from fossilized foliage

system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹“The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out* , page 237).

to table lamps after more than 300 million years. Coal formation declined after the Carboniferous, when fungi mastered the art of

[f] Order Equisetales. *N. from t.*

[g] “Club mosses” in the original. *N. from t.* to decompose fallen wood. In addition to biological eruptions, those due to volcanoes, allied with other geological phenomena, carried the weather from one place to another and the sporadic arrival of asteroids regularly acted as a spoiler for the captives of the Earth. The evidence of these processes offers an unconvincing refuge for those who side with my Texan relative and see climate change as a non-human phenomenon for which we are not responsible – that is when they are willing to accept that the planet is roasting.

We humans and other bipedal apes have followed our distinctively destructive path for a swath of total biotime in this corner of the galaxy. This latest reshaping of nature began 3.3 million years ago, when an australopithecus made stone tools to butcher animal carcasses on the shores of the Jade Sea, Lake Turkana, in Kenya. Weapons came later, with the use of stone-tipped non-throwing spears by another hominid in South Africa 500,000 years ago and the development of the bow and arrow by early humans 71,000 years ago.¹⁰ Thrown weapons like the bow and arrow allowed us to kill large animals without being overly brave. Through a combination of these weapons, coupled with traps and fire, we humans saw to the extinction of woolly mammoths, mastodons, saber-toothed tigers, and ground sloths as the ice sheet receded and we chased the animals to their last redoubts. A South American armadillo-like animal called the glyptodont was another victim of the genocide. This slow-moving vegetarian was as big as a Volkswagen beetle and served as an easy target for hunters who ate its meat and crawled into its massive shells as cover.

For many years, biologists argued that climate change was the most important factor in these extinctions, but mounting evidence points to a correspondence between the arrival of humans and the disappearance of large mammals.¹¹ The case is quite obvious for the spectacular avian life on the islands, with a giant turkey called *Sylviornis* disappearing from New Caledonia shortly after the prehistoric Lapita people arrived in their canoes 3,500 years ago and the removal of numerous species of flightless moas

¹⁰ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹¹ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

when Maori reached New Zealand around AD 1300¹² Extinction has been rebuilding nature since its inception, but no animal has come close to having an impact that humans have. At remarkable speed, our evolution has struck life with the power of the asteroid that wiped out the dinosaurs. The average size of mammals grew steadily throughout the Cenozoic, the era that followed the Chicxulub asteroid impact in the Gulf of Mexico 65 million years ago. Until, around 100,000 years ago, large animals began to disappear. Extinctions accelerated 50,000 years ago, and today the total mass of wild mammals has fallen to a sixth of its pre-human peak. By some models, the domestic cow is on its way to becoming the largest mammalian species left alive.¹³

The skepticism surrounding these dire predictions about the precarious nature of nature is understandable. It takes imagination to escape the influence of the diminishing expectations of each generation. No one has seen a live moa since the century

[h] “Thrusting spears” in the original. It refers to spears that were used as pikes, pushing them to pierce without throwing them. *N. from t.*

XIV and therefore its absence does not worry the New Zealanders today. The last passenger pigeon,[1215]¹⁴ named Martha, died in the zoo of the city where I live in 1914 and the last of the mass migrations of these birds that darkened the sky occurred in the 19th century. We cannot miss something that has never existed for us. We read about extinction as an approaching horror and damage to ecosystems as an ongoing process rather than a fait accompli. However, the destruction does not stop. Despite the publicity given to deforestation, tropical forests continue to disappear at an annual rate of 2.7 million hectares in Brazil, 1.3 million hectares in Indonesia and 0.6 million hectares in the Democratic Republic of Congo.¹⁵ Turning to the direct effects of climate change, a third of the world’s coral reefs were damaged by high water temperatures in 2016. More than 90 percent of Australia’s Great Barrier Reef has been affected by the process called bleaching, which occurs when dinoflagellate algae abandon their animal partners in the exquisite symbiosis of coral.¹⁶ When reefs recover from bleaching,

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹³ Examples:

¹⁴ *Didelphis virginiana*. *N. of t.*

¹⁵ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁶ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

the original animals are replaced by less vigorous coral species that support depleted communities of marine life. This is not a normal phenomenon.

Moving to a more spectacular ecosystem, like my garden in Ohio, we have crafted an Eden amidst the flowering trees and bushes on our triangular plot. The darkest corners are covered with ferns and padded with moss in which amoebas and tardigrades swarm. Moles sift through the soil, fish swim in a pond, and a quartet of chickens wallow in gawking afternoon dust baths. We have tended this suburban oasis for more than twenty years without a drop of pesticide, but its biology is changing rapidly. Many of the glorious insects that were there during the first summers have not returned for a decade. Hummingbird moths[j] and stick insects have disappeared; cabbage white butterflies are the only butterflies these days and night moths no longer swarm around porch lights at dusk. Pure anecdote, yes, but they are personal observations that coincide perfectly with scientific studies that show alarming declines in flying insects.¹⁷

Larger animals are also being affected. My occasional nocturnal itineraries have convinced me that the garden receives few visits from raccoons,[k] possums[l], and skunks.[m] Little brown bats[n] have become so rare that the appearance of a couple of these adorable mammals at dusk is cause for joy. White-nose disease[o] has killed some of these animals and the scarcity of insects must be starving those who have escaped the fungus. The most obvious change has come from the reduction in the number of trees caused by an invasive beetle, the emerald ash borer,[p] whose larvae have killed all the white ash trees[q] in the region. The news does not improve when we leave the outskirts of the city. In the surrounding farmlands, streams are riddled with algae and the large spiders that used to spin their webs on the edges of crops have disappeared. Even mushrooms[r] have become a rarity. Nature is crumbling around us.

The International Union for Conservation of Nature and Natural Resources, or IUCN,[1217]¹⁸ publishes the Red List of Threatened Species, which catalogs species according to their proximity to extinction. When data is available, species are assigned categories ranging from “Least Concern”[t] to “Critically Endangered.”[u] There are also two categories for extinct species: extinct in the wild[v] (such as , for example, the Hawaiian crow[w]) and extinct[x] (such as the passenger pigeon). The IUCN Red List places *Homo sapiens* in the category of “Least Concern” and gives the following justification for it: “classified as Least Concern since the species is widely distributed, it is adaptable, its population is currently growing and there are no major threats that could result in a general decline in its population.”¹⁹ Sure?

¹⁷ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁸ “International Union for Conservation of Nature and Natural Resources, or IUCN” in the original. *N. of t.*

¹⁹ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers[*]< em>*, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we

In the unlikely event that we develop the means to control warming, population will continue to grow but biological diversity will have been wiped out of the world we will inhabit. The large animals will have disappeared from nature. We will find ourselves surrounded by tight crowds of human beings and at the same time alone in nature. This is obvious if we take a random sample from the IUCN list of threatened and critically endangered species: Napoleon wrasse[y] are threatened by reef fishing with harpoons, explosives and cyanide; the common sawfish[z] is critically endangered from hydroelectric dams, pollution, and trophy hunters; the eastern long-beaked echidna [aa] is disappearing from New Guinea, where its habitat is being destroyed by mining companies; and the great hammerhead shark is threatened by the harvest of an estimated 73 million of these elegant fish a year to supply the Chinese market for shark fin soup. The only way to conserve these species is to exclude all contact with humans from their habitats.

Baconian science is at the root of the apocalypse. We have been blessed by advances in medicine, agriculture, and engineering. Science has done exactly what was asked of it and now we are ready for annihilation. If European science had vanished after the discoveries of the 17th century, we would be less numerous and the Earth would not be heating up. Genesis already warned us, as John Milton reformulates it in the story *Paradise Lost*: [bb]

The first disobedience of man, and the fruit

Of that forbidden tree, whose deadly taste

He brought death and all our misfortunes to the world, With the loss of Eden...
(Book I, 1-4)

Unimpressed by God's warning and encouraged by the cunning serpent, Eve makes her fateful decision:

He approached the fruit, plucked it, ate it:

The Earth felt wounded and nature from her seat, Moaning through all her works, gave signs of affliction, All was lost. (Book IX, 781-4)

Eva was the first experimenter, a young woman who tested the limits of her environment and wanted more than an eternity of servitude in a beautiful garden. Milton lived during the height of the scientific revolution and may not have appreciated the power that this metaphor would have in our day. Should John Snow have burned his 1854 map of Soho showing the correspondence between cholera cases and contaminated wells? [cc] That might have helped keep the number of Londoners in check. Perhaps we would have prevented extinction if Louis Pasteur had abandoned his studies on germ theory. And what about the plant pathologists who disregarded centuries of superstition and identified the fungi responsible for cereal diseases? They made it possible to

could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

combat the rusts and blights that were ruining crops and enabled modern agriculture to feed billions of us.

Science is so central to modern civilization that we will not voluntarily avoid continuing to explore and manipulate nature. Now that the downsides of our loss of innocence are apparent, we can either blaze and rave as Dylan Thomas[dd] recommended, or we can weigh plans to gracefully step aside. But whatever we do, we cannot continue to defend the purity of science without acknowledging the terrible cost of its discoveries; “Because this revolt of yours seems to me to be like/Another fall of man” (*Henry V*,[ee] Act II, Scene 3).

In rapid succession, innovations in energy production and transportation, along with advances in agriculture and medicine that sustained population growth, have brought us this increasingly hot world. This dangerous consequence is the fruit of Western science and engineering, founded on the principles of Francis Bacon’s experimental methods, and it is going to lead to the collapse of civilization and ultimately to our extinction. How will we react to this stressful conclusion?

Anticipating the end times, people with a somewhat comfortable lifestyle are likely to want to protect the *status quo* for as long as possible and do little to reduce carbon emissions. Like the French aristocracy of the 18th century, we will perfect an *ethos* of disinterest and bet it all on double or nothing on the hobbies that make us happiest. There will be festivals of denial as long as the celebrants can stand the heat. Before

[cc] Refers to the discovery in London that cholera was caused by the consumption of water contaminated with faecal matter. *N. from t.*

[dd] Referring to Thomas’s poem, “Do Not Go Gentle Into That Good Night”. *N. from t.*

[ee] There are several editions in Spanish of this work by William Shakespeare. *N. t.* Long time passes, away from the noisy scenes and youthful merriment, wars will rage over arable land and freshwater sources, walls and fences will cut across the landscape and armies will be deployed to prevent the poor flood us crossing the borders.

As temperatures rise, the patricians will seek refuge as polar migrants or take to sea on heavily armed ocean liners. Many more millions will live in underground cities, anywhere to escape the sun. Dazzling reports about new methods of absorbing gigatons of carbon dioxide will create waves of excitement and then fade into the news cycle. Fishing grounds and agriculture will collapse, drugs will offer little comfort, and in the end everyone will curl into a fetal position, like the victims buried in the ashes of Pompeii, groaning from the inescapable heat. The likelihood of this outcome increases as the years go by and the smoke rises.

Planetary damage denial is surprisingly resilient in the early years of this century, yet the objections raised against scientific evidence for planetary burn-in from multiple

camps seem increasingly buffoonish.²⁰ This does not mean, of course, that people who accept the facts agree in assessing the urgency of the phenomenon. A survey published in 2017 showed that the majority of corn growers in the Midwestern United States recognized that the weather is less predictable than it used to be.²¹ They had responded by reducing tillage time, planting the latest hybrids, and implementing other strategies to protect their fields from increasingly frequent droughts and floods. They had also expanded the insurance coverage of their crops. However, they remained quite calm, believing that climate change will not have a significant effect on the profitability of their farms and that human ingenuity will solve future challenges. This optimism is understandable among hard-working people who have witnessed amazing technological innovations in agriculture throughout their lives. There are even signs that warmer and wetter weather conditions will boost crop production in the US Midwest.²²

Farmers are experiencing difficult times elsewhere. In the heat of successive summers, India's grain farmers have seen their livelihoods evaporate, and with it any hope of a cooler, wetter future.²³ Suicide rates have risen among these farmers and we have all the ingredients for a pandemic of mental illness in the developing world. Less dramatic responses have been detected in indigenous Inuit communities in northern Canada and wheat farmers in Australia.²⁴ Both groups have been subjected to impressive changes in the climate of their respective regions, which has brought about important changes in their ways of life. Surveys report that these populations are experiencing "ecological sadness" associated with physical changes in their environment and that people in them feel hopeless about the future.

Even those who have not themselves felt the effects of warming have serious doubts about future generations. In the United States, a growing number of young women

²⁰ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

²¹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

²² I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²³ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

²⁴ "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

are expressing concern about having children without "a little more certainty about whether they will have an acceptable world to inherit."²⁵ Every baby avoided is one less person to suffer and one less carbon footprint. Curbing consumerism could help improve environmental forecasts, but our genes fight this; as sure as many people continue to trust that the meaning of life lies in making babies. The situation looks desperate and probably is.

Author Roy Scranton, concluding that we have already crossed the Rubicon and that a technical solution is highly unlikely, recommends that we "learn to die not as individuals, but as a civilization."^[1219] Following a similar logic, in 2017 Canadian doctors Alejandro Jadad and Murray Enkin wrote a provocative editorial in the *European Journal of Palliative Care*, suggesting that we extend hospice care practices to human civilization in as a whole.^[1220] The palliative measures would consist of making the international investments necessary to eradicate hunger and shelter the homeless, as well as committing ourselves to a new era of frugality. They claim that conflicts fueled by declining natural resources could be brought under control by diverting military spending to a global task force to keep the peace. It seems that these actions are asking too much of a civilization that has never been noted for its cooperation, even in the best of circumstances. Nationalism, which is an example of exaggerated narcissism, is the most common *modus operandi* of our species and tribal conflicts grow as environmental stress increases. If we were to knock humanity off its imaginary peak of evolutionary progress, would it be possible for us to get along with each other a little better, even as the lights went out?

To make the case for the importance of redefining *Homo* in this time of warming, it is helpful to recap the essential themes of this book. We live on a Goldilocks^[ff] planet that has nurtured life as it sailed billions of times around the Sun. Animals evolved from microbes that resembled sperm cells wading in the sea; the great apes, or hominids, emerged between 15 and 20 million years ago; apes like us, called hominins, appeared in Africa later, and anatomically modern humans, with fine-boned skeletons, have been strutting around for less than 100,000 years. Plants build their tissues from carbon dioxide and energy from the sun's rays, and we get energy by eating plants and the meat of animals that eat fruits and vegetables. The digestive system releases small molecules from our food that are transported throughout the body through blood vessels to support cells. The architecture and workings of the body are detailed in a condensed instruction manual written in 20,000 genes sprinkled across 2 meters of DNA. Its construction takes nine months and includes wiring a large brain that gives its owner a sense of self and the illusion of free will. The aging of the body is unshakable; after a few decades, the animal stops working and decomposes.

The combination of physical dexterity and brain power has allowed humans to manipulate the environment to suit their needs. No other species has this conscious ability. Hands are crucial: highly intelligent animals with swimming fins and tails

²⁵ Page 114.

don't have the ability to reconstruct their surroundings. In a short time, advances in science and engineering have fueled the rapid expansion of the human population and made modern life luxurious thanks to the burning of fossil fuels. The consequent transformation of the atmosphere has caused the Earth's surface to heat up.

Something very similar may have happened throughout the cosmos. If, as seems likely, life has evolved on other planets, perhaps some aliens have developed levels of technological sophistication that match or exceed our own diligence. "Why is everything so quiet then?" Enrico Fermi wondered, "Where is everyone?" Fermi posed this question, or something like it, over lunch at Los Alamos National Laboratory in New Mexico in 1950.²⁶ Edward Teller was sitting at the same table. The irony of this story is formidable. Fermi was "the father of the atomic bomb" and Teller would end up being "the father of the hydrogen bomb".²⁷ If their comic coincidence had been closer in time, Fermi, after asking his question, would have looked at Teller and said, "Oh, sure!"

The *silentium universi*, or Great Silence, has many explanations, and physicists wrestle with Drake's equation to estimate the probability of contact.[28] Variables in this calculation include things like the rate of star formation (R^*) and L , the length of time during which extraterrestrial civilizations could produce detectable signals. Nuclear weapons development may be a popular way to limit L , but I bet suicide by burning fossil fuels is a more typical endgame among extraterrestrials.

I imagine that the children in the alien classrooms learn about the universal rule that any life form that develops enough technology to extinguish itself will eventually do so in the near future. There are different stages in this process, comparable to the stages of cancer development, from Stage Zero, when the disease is in one place, to Stage Four, when cancer cells have spread to other organs. As Christopher Hitchens wrote during his illness, "The good thing about Stage Four is that there is no Stage Five." As a species, we have hovered around Stage Four for over 100,000 years. "How long have humans been gone from Earth?" asks a school teacher from the planet Zeta, and noodle-like appendages rise up excitedly around the classroom.

Each generation has played its part in causing yields to decrease for subsequent generations. It would be absurd to admonish my father for driving an Alfa Romeo to work in the 1970s instead of saddling a mule. Nowadays, when the atmospheric consequences of driving are evident, we could try to share cars, but this goes against the capitalist desire for personal control. Thinking about how to curb carbon emissions is something we are also discouraged when considering that the damage has already been done and any benefits from stopping now will be decades away.²⁸ A typical reaction among *online* commentators who understand that we would still be warming even if we were able to stop all carbon emissions right now is that it might be best to let

²⁶ "Sweat lodge" in the original. *N. from trans.*

²⁷ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

²⁸ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

things take their course and enjoy "before let the latrine burn", as Jim Morrison said – letting humanity destroy itself and allowing the planet to restart in our absence.²⁹

The rest of nature will celebrate our departure. If the aliens had focused their microphones on Earth, they would have detected an increase in the exclamations of animal life over the last millennia, constituting a *crescendo* of moans and grunts coming from animals subjected to torture ritualized in stadiums, bullrings, and bear pits,[gg] augmented by modern vivisection of rodents, cats, and primates—terrified animals bound and shackled to chairs and probed with instruments that would have tested the pornographic inventiveness of Catholic inquisitors. The philosopher Schopenhauer said: "Unless *suffering* was the direct and immediate goal of life, our existence must have completely failed its purpose."³⁰ Current justifications for such horrors include the economic burden of treating animals in a less cruel way and the medical necessity of experimentation. As always, we rest on a staggering arrogance. Everything always revolves around us.

This lack of empathy for other animals is at odds with the idea that we have an instinctive love for nature, called "biophilia." Biophilia was popularized by Harvard biologist EO Wilson, who suggested that we retain feelings of empathy from our relationship with wildlife on the grasslands of Africa.³¹ However, there is no evidence for this behavior and the concept has no evolutionary meaning.[34] Human beings are as kind to the natural world as our destruction of it suggests. For every child who enjoys tumbling stones in a stream, there is a friend of theirs who recoils in horror at the sight of a frog or a crab brandishing its claws.³² If there is anything instinctive, it is the propensity to chase and kill. Educational natural history programs can work wonders in reprogramming the behavior of some children who would otherwise become biophobic for the rest of their lives, but as long as other distractions are available, many more will resist them. charms of bird watching.

Wildlife documentary producers have fed the illusion for decades that their shows could evoke some mysterious reverence for nature and thereby help save the planet. We were thrilled to experience the splendor of a tropical rainforest on television and

²⁹ "National forests" in the original. *N. from trans.*

³⁰ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

³¹ "Wilderness way" in the original. "Wilderness" is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as "wild nature". Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

³² "Wise-use movement" in the original. The "Wise Use" movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

saddened by the brief snippet at the end of the show showing logging trucks roaring along dusty tracks. The best zoos use a similar approach when addressing their visitors, displaying the animals for their recreational value and noting their endangered species status on a sign attached to the fence or glass. The children yell at the gorillas, enjoy ice cream and drive home. The evidence that zoos stimulate a lasting passion for animal conservation is very weak.[36]

Conservation biologists may empathize with other life forms, but they cause almost as much damage to the planet as their biophobic neighbors. A charitable contribution here and there is not going to change the outcome. Solar panels and electric cars are the funeral decorations at Earth's funeral. One of the difficulties is that the greatest wounds are inflicted passively, through the simple act of continuing to be part of modern life. John Lennon said, "Life is what happens to you while you're busy making other plans." And the same goes for climate change. As they wait for Godot, Estragon says, "I can't go on like this." Vladimir replies: "That's what you think."³³

Human selfishness has put us in the unenviable position of having to preside over the collapse of the biosphere. To be present at this historical juncture is to be in a position of unpleasant exclusivity, like the situation of the Romans who

[gg] "Bear pits" in the original. Bear pits were pits surrounded by a fence in which bears were displayed, for the entertainment of the public and to make them fight to the death with dogs. *N. t.* happened to be living near Mount Vesuvius in AD 79. There was also nothing positive about witnessing the Great Plague during the 14th century. Like me, pus-swollen plague victims believed they were facing the end of civilization, along with their own deaths. At least we won't have to worry about eternal damnation. And in the face of this impressive situation, perhaps we will finally overcome our narcissism. Whether you are a celebrity or a peasant, nothing is going to save you and in the future there will be no one here who cares about your legacy. He may have sold millions of books or records, or filled stadiums with admirers of his athletic prowess, but soon no one will give a damn about all that.

The state of grace, which I understand as gratitude for the experience of consciousness and for our fleeting participation in nature, seems like the sharpest mental exercise. "Departing nobly gives man a certain elegance," says the leader of the Ancients of Argos in Aeschylus's *Agamemnon*.^[38] He is talking to Cassandra, who has realized that she will be killed. Expressions of grace have always served this function in the face of personal demise, and their value need not be diminished when we accept that civilization is approaching its final day. What is different this time is that the spotlight is on the great carnival of nature, looking directly at what we have ruined. We gain some personal sense of liberation by admitting guilt, even though our victim is the whole of creation and we are among the casualties.

In *Paradise Lost*, Eve suggests a pact with Adam as she begins to understand that the punishment for her fall from grace is death: "Why should we continue to tremble

³³ "Between villages there is a death zone" in the original. *N. from t.*

with fear?” (book X, 1003). He feels terror for his own future and that of his offspring and thinks that suicide will end the punishment, “Thus we will mock the voracious appetite of death and, with both, / it will be forced to satisfy its jaws” (99091). In the end, the first couple chooses to accept the punishment as it was meted out and to embrace parenthood in the meantime. Adam and Eve conform to God’s plan. We are doing the same, unable to change course. The best thing each of us can do until the sky falls is to be kinder to each other and compassionate to the rest of nature as it suffers with us on this watery globe. And who knows, if we behave better, things may go on for longer than we thought.

Grades:

1. These opening lines are adapted from *The Decline and Fall of the Roman Empire*, by Edward Gibbon,[hh] vol. IV, chapter 38 (New York, 1944), page 119: “The rise of a city, which grew into an empire, may deserve, as a singular prodigy, the reflection of a philosophical mind. However, the decline of Rome was the natural and inevitable effect of inordinate grandiosity. Prosperity makes the fruit of decadence ripen; the causes of the destruction multiplied due to the extension of the conquest; and, as soon as time or accident had eliminated artificial supports, the formidable structure gave way under the pressure of its own weight. The story of its downfall is simple and obvious; and instead of wondering *why* the Roman empire was destroyed, we should rather be surprised that it lasted so long

[hh] There are various editions in Spanish under the title “History of the decline and fall of the Roman Empire”. *N. of t. time*. If you can find the time to immerse yourself in reading this six-volume masterpiece, Gibbon’s voice will be with you for life.

2. More information about these circumstances can be found by consulting the following sources:

- *Global warming*:[\[https://climate.nasa.gov/\]](https://climate.nasa.gov/)[\[https://climate.nasa.gov.\]](https://climate.nasa.gov/)
- *Ocean acidification*:[\[http://www.whoi.edu/ocean-acidification\]](http://www.whoi.edu/ocean-acidification)[\[www.whoi.edu/ocean-acidification\]](http://www.whoi.edu/ocean-acidification)and[\[http://nas-sites.org/oceanacidification/\]](http://nas-sites.org/oceanacidification/)[\[http://nas-sites.org/oceanacidification/\]](http://nas-sites.org/oceanacidification/).]ii
- *Pollution of the oceans by plastics*:[\[http://www.sciencemag.org/tags/plastic-pollution\]](http://www.sciencemag.org/tags/plastic-pollution)[\[www.sciencemag.org/tags/plastic-pollution\]](http://www.sciencemag.org/tags/plastic-pollution)[\[http://www.sciencemag.org/tags/plastic-pollution\]](http://www.sciencemag.org/tags/plastic-pollution)[\[http://www.sciencemag.org/tags/plastic-pollution\]](http://www.sciencemag.org/tags/plastic-pollution).]jj
- *Air pollution*:[\[http://www.who.int/airpollution/en\]](http://www.who.int/airpollution/en)[\[www.who.int/airpollution/en.\]](http://www.who.int/airpollution/en)
- *Deforestation*:[\[http://www.worldwildlife.org/threats/deforestation\]](http://www.worldwildlife.org/threats/deforestation)[\[www.worldwildlife.org/threats/deforestation.\]](http://www.worldwildlife.org/threats/deforestation)
- *Disappearance of Grasslands*: Karl-Heinz Erb *et al.*, “Unexpectedly Large Impact of Forest Management and Grazing on Global Vegetation Biomass”, *Nature*, DLIII (2018), pp. 73-76.

- *Reducing Lake Area*: Kate Ravilious, “Many of the World’s Lakes are Vanishing and Some May be Gone Forever,” *New Scientist* (March 4, 2016), Available at[<http://www.newscientist.com/article/2079562>][www.newscientist.com/article/2079562](2016).

- *Desertification*: [<http://www.un.org/en/events/desertificationday>][www.un.org/en/events/desertificationday]

- *Soil erosion*: Pasquale Borrelli *et al.* “An Assessment of the Global Impact of 21st Century Land Use on Soil Erosion”, *Nature Communications*, VIII/2013 (2017).

- *Population forecasts*: [<http://www.un.org/development/desa/en/news/population>][www.un.org/development/desa/en/news/population]

3. See:

- *A summary of the threats posed by climate change to biodiversity*: Rachel Warren *et al.*, “The Implications of the United Nations Paris Agreement on Climate Change for Globally Significant Biodiversity Areas”, *Climatic Change*, CXLVII (2018), p. 395-409

- *Extreme Weather*: [<http://www.ucsusa.org/>][www.ucsusa.org/]

- *Droughts*: S. Mukherjee, A. Mishra and KE Trenbert, “Climate Change and Drought: A Perspective on Drought Indices”, *Current Climate Change Reports*, IV (2018) , p. 145-163.

- *Extinctions of large mammals*: Felisa A. Smith *et al.*, “Body Size Downgrading of Mammals Over the Late Quaternary”, *Science*, CCCLX (2018), pp. 310-313.

ii Currently (2021) this link refers to:[<https://www.nationalacademies.org/our-work/development-of-an-integrated-science-strategy-for-ocean-acidification-monitoring-research-and-impacts-assessment>][<https://www.nationalacademies.org/our-work/development-of-an-integrated-science-strategy-for-ocean-acidification-monitoring-research-and-impacts-assessment>][<https://www.nationalacademies.org/our-work/development-of-an-integrated-science-strategy-for-ocean-acidification-monitoring-research-and-impacts-assessment>]

[jj] Link not currently operational, although it refers to the *Science* page. *N. from t.*

[kk] Link not currently operational, although it refers to the WWF page. *N. from t.*

- *Loss of fishing grounds*: Qi Ding *et al.*, “Estimation of Catch Losses Resulting from Overexploitation in the Global Marine Fisheries”, *Acta Oceanologica Sinica* , XXXVI (2017), pgs. 37-44.

- *Insect disappearance*: Caspar A. Hallmann *et al.*, “More than 75 per cent Decline over 27 Years in Total Flying Insect Biomass in Protected Areas”, *PLOS ONE*, XII/10 (2017), e0185809.

- *Disappearing Plants*: [<http://www.stateoftheworldsplants.com/>][www.stateoftheworldsplants.com/]

- *Microbial losses*: SD Veresoglou, JM Halley and MC Rillig, “Extinction Risk of Soil Biota”, *Nature Communications*, VI/8862 (2015).

4. NASA’s Global Climate Change webpage provides more information: [https://climate.nasa.gov/vital-signs/sea-level][https://climate.nasa.gov/vital-signs/sea-level;] see also IMBIE Team article,[mm] “Mass Balance of the Antarctic Ice Sheet from 1992 to 2017”, *Nature*, DLVIII (2018) , p. 219-222.

5. Human origins have become more complicated due to evidence that modern humans arose from multiple populations of *Homo sapiens* interbreeding with other *Homo* species > closely related and spread throughout Africa. See Eleanor ML Scerri *et al.*, “Did Our Species Evolve in Subdivided Populations across Africa, and Why Does it Matter?”, *Trends in Ecology and Evolution*, XXXIII/8 (2018), pp. 582-594.

6. S. Wynes and KA Nicholas, “The Climate Mitigation Gap: Education and Government Recommendations Miss the Most Effective Individual Actions”, *Environmental Research Letters*, XII (2017), 074024.

7. Thomas Malthus, *An Essay on the Principle of Population* (London, 1798).[nn]

8. Paul R. Erlich, *The Population Bomb* (New York, 1968). The human population has doubled in the half century since the publication of this book. In 2009 Paul Erlich and his wife and co-author, Anne Erlich, wrote: “Perhaps the most serious flaw in *The Bomb* was that it was too optimistic about the future.” This verdict appears in his essay “The Population Bomb Revisited”, *Electronic Journal of Sustainable Development*, I/3 (2009), p. 66.

9. Carbon dioxide levels also plummeted during the Eocene, turning the Earth from a greenhouse to a refrigerator. Marine organisms called diatoms, whose abundance increased in the Eocene oceans, may have been partly responsible for this transformation of the atmosphere. See David Lazarus *et al.*, “Cenozoic Planktonic Marine Diatom Diversity and Correlation to Climate Change”, *PLOS ONE*, IX/1 (2014), e84857. These glass-shelled microbes absorbed carbon dioxide and released oxygen, helping to cool and oxygenate the planet as much as the rain forests that grew on land.

10. See:

- *Early Butchery Tools*: Sonia Harmand *et al.*, “3.3-million-year-old Stone Tools from Lomeki 3, West Turkana, Kenya”, *Nature* , DXXI (2015), pp. 310-315.

- *Hafted projectiles*: Jayne Wilkins *et al.*, “Evidence for Early Hafted Hunting Technology”, *Science*, CCCXXXVIII (2012).pp. 942-946.

- *Bow and arrows*: Kyle S. Brown *et al.*, “An Early and Enduring Advanced Technology Originating 71,000 Years Ago in South Africa”, *Nature* , CDXCI (2012), pgs. 590-593.

11. Frédérick Saltré *et al.*, “Climate Change Not to Blame for Late Quaternary Megafauna Extinctions in Australia”, *Nature Communications*, VII (2017), 10511.

12. RP Duncan, AG Boyer, and TM Blackburn, “Magnitude and Variation of Pre-historic Bird Extinctions in the Pacific,” *Proceedings of the National Academy of Sciences*, CX (2013), pp. 6436-6441; Morten E. Allenfort *et al.*, “Extinct New Zealand

Megafauna Were Not in Decline before Humans Colonization”, *Proceedings of the National Academy of Sciences*, CXI (2014), pp. 4922-4927.

13. Smith *et al.*, “Body Size Downgrading of Mammals,” p. 310-313.

14. Nancy L. Harris *et al.*, “Using Spatial Statistics to Identify Emerging Hot Spots of Forest Loss”, *Environmental Research Letters*, XII (2017), 024012.

15. Quirin Schiermeier, “Great Barrier Reef Saw Huge Losses from 2016 Heatwave,” *Nature*, DLVI (2018), pp. 492-496.

16. Hallmann *et al.*, “More than 75 per cent Decline over 27 Years.”

17. Classification of *Homo sapiens* in the IUCN Red List of Threatened Species, available at [<http://www.iucnredlist.org/details/136584/0>][www.iucnredlist.org/details/136584/0][oo]

18. Jean Daniel Collomb, “The Ideology of Climate Change Denial in the United States”, *European Journal of American Studies*, IX/1 (2014). This article reviews some of the foundations of climate change denialism in the United States.

19. AS Mase, BM Gramig, and LS Prokopy, “Climate Change Beliefs, Risk Perceptions and Adaptation Behavior among Midwesterner US Crop Farmers,” *Climate Risk Management*, XV (2017), pp 8-17; JE Doll, B. Petersen and C. Bode, “Skeptical but Adapting: What Midwestern Farmers Say about Climate Change”, *Weather, Climate, and Society*, IX (2017), pp. 739-751.

20. B. Basso and JT Ritchie, “Evapotranspiration in High-yielding Maize and under Increased Vapor Pressure Deficit in the US Midwest”, *Agricultural and Environmental Research Letters*, III (2018), 170039. Other studies indicate a steady decline in corn, soybean and wheat production under warmer conditions: Bernhard Schauburger *et al.*, “Consistent Negative Response of US Crops to High Temperatures in Observations and Crop Models”, *Nature Communications*, VIII (2018), 13931.

21. Tamma A. Carleton, “Crop Damaging Temperatures Increase Suicide Rates in India,” *Proceedings of the National Academy of Sciences*, CXIV (2017), pp. 87468751. Carleton’s study provoked several criticisms and she defended her work in a

Currently *H. sapiens* does not appear in the list. *N.* detailed response: TA Carleton, “Reply to Plewis, Murari *et al.*, and Das: The Suicide-temperature Link in India and the Evidence of an Agricultural Channel are Robust” , *Proceedings of the National Academy of Sciences*, CXV (2018), pp. e118-121. H. Majeed and J. Lee have expressed general concern about the impact of climate change on children’s mental health, “The Impact of Climate Change on Youth Depression and Mental Health”, *Lancet Planetary Health* , I (2017), e94-95.

22. A. Cunsolo and NR Ellis, “Ecological Grief as a Mental Health Response to Climate Change-related Loss”, *Nature Climate Change*, VIII (2018), pp. 275-281.

23. Maggie Astor, “No Children Because of Climate Change? Some People Are Considering It”, *New York Times* (February 5, 2018); the quoted comment, which has harrowing Miltonian overtones, was made in an *online post* as a result of an essay: Madeline Davies, “With Environmental Disasters Looming, Many Are Choosing Childless Futures,” February 5, 2018 , [<http://www.jezebel.com/>][[www.jezebel.com.](http://www.jezebel.com/)]

24. Roy Scranton, *Learning to Die in the Anthropocene: Reflections on the End of Civilization* (San Francisco, CA, 2015), p.21.[pp]
25. AR Jadad and MW Enkin, “Does Humanity Need Palliative Care?”, *European Journal of Palliative Care*, XXIV (2017), pp. 102-103.
26. Eric M. Jones, “Where Is Everybody?”, *Physics Today*, XXXVIII (1985), p. eleven.
27. In case you need a reminder, atomic bombs work through nuclear fission and hydrogen bombs get additional explosive power through the combination of fission and fusion reactions. In the atomic bomb, the detonation of a conventional chemical explosive causes uranium or plutonium atoms to stick together, causing them to split into lighter elements and releasing heat and gamma rays. Hydrogen bombs, or thermonuclear weapons, use this type of fission reaction to cause a second reaction, in this case fusion, that releases more energy.
28. David. C. Catling, *Astrobiology: A Very Short Introduction* (Oxford, 2013).
29. It is not my intention to show disrespect for Pastafarians[qq]: see [<http://www.venganza.org/>][[www.venganza.org.](http://www.venganza.org/)]
30. Christiana Figueres *et al.*, “Tree Years to Safeguard Our Climate”, *Nature*, DXLVI (2017), pgs. 593-595. The authors of this provocative text suggest targets for 2020 that would allow us to limit the increase in warming to 1.5°C above pre-industrial levels. This was the threshold set in the 2015 Paris Agreement.
31. Jim Morrison’s memorable quote comes from his poem “American Night,” which appears on The Doors’ album *An American Prayer* (Elektra/Asylum Records 1978).
[pp] There is an edition in Spanish: *Learn to live and die in the Anthropocene*, Errata Naturae, 2021. *N. from t.*
- [qq] “Pastafarianism” or “Church of the Flying Spaghetti Monster (FSM)” [Church of the Flying Spaghetti Monster (MEV)] is a parody religion whose divinity is the MEV. It is legally recognized as a religion in some countries. *N. from t.*
32. Arthur Schopenhauer, *Studies in Pessimism: A Series of Essays by Arthur Schopenhauer*, trans. TB Saunders (St. Clair Shores, MI, 1970), p. 11, italics in the original. In *Middlemarch*,[rr] George Eliot wrote about hearing the suffering in the world as a “roar that lies on the other side of silence”.
33. The term “biophilia” was coined by Erich Fromm in *The Anatomy of Human Destructiveness* (New York, 1973).[1222]³⁴ EO Wilson popularized the idea in *Biophilia* (Cambridge, MA, 1984).[tt]
34. Ryan Gunderson, “Eric Fromm’s Ecological Messianism: The First Biophilia Hypothesis as Humanistic Social Theory”, *Humanity and Society*, XXXVIII (2014), pp. 182-204.
35. Wilson tried to get around this objection by expanding the definition of biophilia to include the option of an innate aversion to nature. This is as absurd as trying to

³⁴ There are various editions in Spanish under the title: *Anatomy of human destructivity*. *N. from t.*

shoehorn aversion to England and the English into the meaning of Anglophilia. A detailed critique of biophilia is offered by Y. Joye and A. de Block in “Nature and I Are Two’: A Critical Examination of the Biophilia Hypothesis”, *Environmental Values*, XX (2011), pp. . 189-215.

36. Eric Jensen, “Evaluating Children’s Conservation Biology Learning at the Zoo,” *Conservation Biology*, XXV (2015), pp. R391-394.

37. Samuel Beckett, *Waiting for Godot: A Tragicomedy in Two Acts* (New York, 1954), Act II, p. 61.[uu]

38. Aeschylus, *The Oresteia*, trans. Robert Fagles (London, 1984), p. 50.[vv]

Progress versus wild nature

Progress versus wilderness¹

By Ted Kaczyński

The personal point of view of this author is that "progress" (as the term is understood in modern society) is incompatible in the long term with the conservation of wild natural spaces.² However, the purpose of this article is not so much to persuade the reader that this point of view is correct as to get him to face the issue squarely and make a decision for himself, one way or the other.

The fact that there is a conflict between economic growth, on the one hand, and wilderness, freedom, and a healthy environment, on the other, is implicit in any discussion of wilderness values. However, there seems to be a general reluctance to bring this issue out into the open and ask explicitly whether genuine wilderness can be conserved if economic progress continues.

For example, when this author recently worked for a local chapter of the Audubon Society, he mentioned to a couple of members that chronic evil of environmentalism: As conservation organizations solve one problem, six others grow to take its place. These men strongly agreed. "Yes," they said, "it can be daunting. Problems multiply faster than solutions." This writer then suggested that the only cure might be a fundamental change in our society's attitude toward economic progress. At this, the Audubon men were very cold. They neither wanted to affirm nor deny that there was an irreconcilable conflict between wilderness and "progress." They seemed totally reluctant to discuss the matter. It was uncomfortable for them.

This is an unhealthy situation. Conflict must be faced directly and discussed in explicit terms. This article will outline the personal conclusions of the author and perhaps this will force the reader to reflect on the problem and come to his own definite opinion.

¹ Translation by Último Reducto of Theodore John Kaczynski's article "Progress versus Wilderness" (Date unknown, probably 1979 or later). The reader should know that the source from which the original text came, a closed *web* page, was not at all reliable. Although, due to its style and content, the original text appears to be authentic, it could be that some parts or words of it had been altered, voluntarily or involuntarily, in the transcription to said page. For example, it is not clear that inappropriate substitutions between the terms "wilderness" and "wildness" have not occurred in some cases. *N. from t.*

² "Wilderness" in the original. The term "wilderness" lacks an equivalent term in Spanish and refers to areas or ecosystems with little or no humanization. It can be translated in various ways depending on the context. In this text, unless explicitly stated otherwise, it has been translated as "wild areas". *N. from t.*

The conflict at hand can be expressed more precisely using the concept of “wildness”³ expounded by Roderick Nash (“The Future of Wilderness: The Need for a Philosophy”, *Wild America*, July 1979). The wild is what is not controlled by organized society. Today, the wilderness offers the greatest opportunity to experience the wilderness.

“Progress,” as it is currently understood, implies the relentless improvement of efficiency in economic productivity, in education, in medicine, in communications, and in any other socially accepted area of activity, including recreation in school. nature.⁴ To those who have experienced power outages, traffic jams, or poor postal service, this idea may seem ridiculous, but these problems are nothing more than the growing pains of a society that primarily moves in the direction of efficiency. Despite the blackouts, electricity does more work for us than ever before; despite fuel shortages, people travel farther and faster than they did ten years ago.

But efficiency implies control. The wild,⁵ the uncontrolled, the unpredictable stand in their way. For this reason, rules and regulations multiply without ceasing. Government and private organizations maintain computerized files with personal information about each of us. Some school systems have introduced “behavior modification” programs that apply the principles of operant conditioning to students whose behavior in the classroom is considered too rebellious. These phenomena are not accidental aberrations, but an integral part of the course of development of our society.

The increasingly organized life of the city becomes a straitjacket. More and more urbanites want to escape to nature;⁶ so many that recreation in nature⁷ itself must be organized efficiently. Trails are maintained, rescue helicopters are available, and wilderness hikers⁸ must provide rangers with their itinerary. In some wilderness areas, fires can only be built in designated places and hikers must stay on boardwalks to protect delicate mountain meadows.

More and more stockbrokers and engineers are carrying factory-made backpacks on officially designated trails, but few today get the chance to experience a long-term stay in wilderness and primitive conditions. Mountaineers in the Appalachians can no longer lead the independent lives they did sixty years ago. The Eskimos and North Indians, reduced by snowmobiles and outboard motors, have gained in efficiency and comfort, but have lost the independence of their ancestors, who could do everything they needed to do with their bare hands.

³ “Wildness” in the original. It refers to the quality of being wild, to the wild character of natural things. Here it will be translated as “the wild”. *N. from t.*

⁴ “Wilderness” in the original. *N. from t.*

⁵ *idem. N. from t.*

⁶ *idem. N. from t.*

⁷ *ditto. N. from t.*

⁸ “Back-country hikers” in the original. *N. from t.*

Most of the northern lakes, isolated as they may appear on the map, are now visited by wealthy fishermen who arrive by small plane. Our remnants of wilderness⁹ are being reduced to artificially preserved museum pieces for the entertainment of the wealthy.

In fact, the wild is disappearing from natural spaces,¹⁰¹¹ as from all other aspects of modern life. This is a necessary consequence of the fact that the more we progress, the more our progress depends on the efficient organization of the environment as a whole.

But could we not accept progress only insofar as it does not conflict with our natural need¹² or with our other spiritual needs? Could we not accept only those technical innovations that really benefit man in all his integrity?

Of course yes. We could also love our neighbor, stop telling lies, have no more wars, sell everything we have and give it to the poor, and brush our teeth after every meal. We could all be angels.

But such speculations are sociologically naive. Instead of asking what *we could do* if we were all saints, we should ask what *we will do* with economic progress. And the answer to that question is clear if we take a look at the past.

“But we have learned the lessons of the past, haven’t we?” Yes. Lessons of a strictly technical nature. We have learned that logging must be regulated if we do not want to run out of wood. We have learned that we must stop spraying DDT indiscriminately if we don’t want to poison ourselves. In other words, we have learned that some of our past practices have been *technically inefficient*. But we have not learned to curb the drive toward technical efficiency and material wealth where these conflict with other values.

History shows that societies simply don’t learn such lessons, even though many individuals within a society may learn them. There are at least three reasons for this. One is that the egos of politicians, industrialists, and other members of the controlling elite are gratified by the grandiose. Every mayor, governor, or president prefers to be at the head of a dynamically expanding system and likes to boast that their city, state, or nation’s economy has grown several percentage points during their administration. The spiritual needs of men, and even to some extent their physical health needs, are inconvenient obstacles and are therefore overlooked.

A second reason is that even if all individuals in a society became convinced of the importance of wilderness, wilderness, and a healthy environment, this would not necessarily change their behavior. This author has observed that most conservationists do not differ significantly from the rest of the population in their personal consumption

⁹ “Wilderness” in the original. *N. from t.*

¹⁰ *Idem. N. from t.*

¹¹ *Idem. N. from t.*

¹² For example: “*In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*” (*Earth’s Revenge*, page 166).

habits, even though we all know that our consumption of goods and services contributes to pollution problems and encourages pollution. exploitation of the natural resources that exist in the intact areas that we still have left.

A third reason why societies do not "learn their lessons" is the fact that the behavior of a society collectively does not necessarily conform to the individual wills of the members of that society. The Great Depression of the 1930s was not the result of any natural catastrophe; it was a consequence of human economic behavior. No one wanted her, but it happened anyway. The pollution and crowding problems of our time were neither planned nor expected; no one wanted them; they just happened. The point is that millions of people working together in a complex system can produce unwanted effects for any of the individuals involved. Our society is a great machine, we are the components of that machine and our individual wills do not govern its behavior.

This is an oversimplification. It may still be possible for human choice to change the direction in which our society is developing. But the problem of running our society cannot be compared to that of, say, driving a car. It is rather like trying to divert the course of a charging elephant. We cannot limit ourselves to theoretically determining an ideal balance between progress and nature and expecting our society to achieve and maintain that balance.

Similarly, we could try to specify that an ideal wilderness should contain as many trout, as many mosquitoes, as many coyotes, etc. But everyone with some ecological training knows that the population of each of the different species in a stable ecosystem cannot be arbitrarily specified. For there to be stability, the quantities must have a certain relation to each other. If an arbitrarily chosen number of animals of various species were placed in an unoccupied area, the numbers would change rapidly until a system of stable proportions was reached.

The same principle can be applied to all complex systems, including modern industrial societies. In theory, the ideal society should have only the amount of economic and technical progress that allows it not to interfere with freedom, the values of nature, and the like. But there is no reason to suppose that this represents a sociologically stable situation. On the contrary, experience suggests that if technical efficiency, in the modern sense of the expression, is accepted as a goal by any society, then it tends to become the dominant goal; if we want to restrict it, we must totally and unequivocally reject it. This seems to be the price we must pay if we really want to preserve wild nature.¹³

¹³ "Wildness" in the original. *N. from t.*

Uncategorized

Review of The Metaphysics of Technology¹

1. The author:

Unlike what happens with the huge majority of his colleagues, the so-called philosophers of technology, who either don't adopt a clear stance against modern technology or openly defend it, Dr. Skrbina's stance is manifestly contrary to modern technology.

In recent years the author has been appearing in public as some sort of herald of the critique of technoindustrial society, or even of the "revolution" against it, using for this, both his academic credentials and his personal relationship and collaboration (through correspondence exchange) with Theodore John Kaczynski, also known as the "Unabomber".² Yet, despite using this latter relationship for the public promotion of his own ideas and career, Dr. Skrbina's stance is far away from Kaczynski's or from any other stance which actually pursues the total destruction of technoindustrial society.

The book is worth being reviewed, if only for getting an idea of what this self-proclaimed spokesperson of the "anti-tech revolution"³ really thinks and defends.

2. The book:

The fundamental thesis of this book is what the author calls the "Pantechnikon" (form Greek "pan" -all, everything, whole- and "techne" -technique, craft, or something like that-), which basically states that everything in the universe is "technology". Ac-

¹ Review of David Skrbina's book, *The Metaphysics of Technology* (Routledge, 2015). Reviewed by Last Redoubt. This is a translation from the original review in Spanish.

² See, for example: The interview "Catching Up With the Unabomber. When Does the End Justify the Means?" (unknown date and original medium, now it can be read at: [<https://www.thepsychopath.org/catching-up-with-the-unabomber-when-does-the-end-justify-the-means/>][<https://www.thepsychopath.org/catching-up-with-the-unabomber-when-does-the-end-justify-the-means/>][<https://www.thepsychopath.org/catching-up-with-the-unabomber-when-does-the-end-justify-the-means/>]); the interview "David Skrbina on Ted Kaczynski, Technological Slavery, and the Future of Our Species", in *Manifold* YouTube channel, episode #7, April 4, 2019

³ See, for example, the flyer "The Grand Revolution: Toward an End to the Technological System" (December 1st, 2019):[https://drive.google.com/open?id=1ZDN_mXk5vUT32x-ylhz9zrSB9TMyMTG-][https://drive.google.com/open?id=1ZDN_mXk5vUT32x-ylhz9zrSB9TMyMTG-][https://drive.google.com/open?id=1ZDN_mXk5vUT32x-ylhz9zrSB9TMyMTG-]

cording to Dr. Skrbina, this metaphysical thesis is indispensable for explaining why human technology has been developing throughout history to its current degree of complexity and extent, which threatens to destroy Nature on Earth and to make humans obsolete. In short, according to him, the whole universe tends to grow and to become ever more complex because there is a natural force which pushes it in that direction. Modern technology is just the height of this universal development towards complexity. And, from this, the author concludes that every developmental process that takes place in the universe is a technological process (the expression of the “Techne-Logos” or “Pantechnikon”, which are the ways the author calls this universal push towards complexity). Modern technology would just be the most elaborated and complex expression of that “technological” character of the cosmos.

In addition, in his book, Dr. Skrbina tells us that this push is the expression of a conscience, intelligence or mind that underlies the physical reality of the universe. Such mind, supposedly, would be the “Logos” of the ancient Greeks. Dr. Skrbina and other modern teachers of (the history of) philosophy use the term “panpsychism” (from Greek “pan” and “psyche” -soul or mind-) to refer to their belief that everything in the universe has a mind and/or that these alleged particular minds in everything are the concrete expressions of the general mind of the universe.

According to the author, that process of development towards complexity in the universe, threatens to strip us of all autonomy -or even to make us vanish- and to destroy Nature on Earth, because the more complex technology gets, the more autonomous it gets in turn, and the more it determines our lives and the natural processes.

Thus, Dr. Skrbina raises a dilemma: either we allow this to happen, or we take the reins of social and technological development at once and revert it peacefully and gradually to some adequate level. He calls this second option “creative reconstruction”.

This is roughly the central argument of this book. However, most of the 311 pages of the book are devoted to making a revision of the history of the part of philosophy which, according to Dr. Skrbina, is about the technological phenomenon, from ancient times (Greece and China) to the present day.⁴ The author, as a “good” teacher of (the history of) philosophy, sows this historical tour with numerous references to and quotes from other authors. In fact, his own stance regarding technology and the main thesis of the book are merely mentioned in passing in just a few paragraphs or lines interspersed among such a historical review or, at most, they are explained in a few pages mainly concentrated in the second part of the book.⁵

Let’s revise the main virtues and some of the more serious flaws of the book below.

⁴ In Part I (“Metaphysics”), chapters 2, 3, 4, 5 and 6 (pages 19-88 and 90-114) and in Part II (“Praxis”), chapters 7, 8 and 10, (pages 117-177 and 211-235), in addition to pages 183-201 of chapter 9.

⁵ Especially in chapter 1 (pages 9-18), in pages 89-90 of chapter 5, in pages 178-183 and 201-210 of chapter 9 and in chapters 11, 12 and Epilogue (pages 236-290) .

3. The virtues:

The book has basically three good points; or, at least, three points which could be regarded as interesting, important or useful:

a. *The tendency of systems towards growth and complexity.* According to Dr. Skrbina, technological development is actually the expression of a general process which happens in the universe, through which, as long as enough available energy exists, dynamic systems will tend to expand and to get ever more complex. This process is simply an effect of the laws of thermodynamics, which create differentials or fluxes of energy that can be used by some systems to maintain and develop their own internal structure.⁶

While some details could be discussed or clarified and some nuances could be made about this powerhouse of the development of complexity, and while Dr. Skrbina's metaphysical way of understanding and expressing it is more than debatable, as we will see later, in principle, the basic idea about this universal tendency of systems to expansion and complexity seems to be quite right generally.

b. *Technological autonomy and determinism.* Dr. Skrbina acknowledges that technological autonomy and determinism are basic aspects of the problem of modern technology and its development. Generally, as systems develop their complexity, they produce their own behaviors and internal dynamics (autonomy). Moreover, systems interact with other systems, their environment, through processes that follow physical laws, and this produces some effects in such an environment. Particularly, as technological systems and processes increase their autonomy, they get progressively less controllable by humans and, in turn, the ecological and social conditions in which they operate become more and more determined by them. This process of development implies a progressive loss of autonomy (freedom) for human beings and an ever bigger impact on natural ecosystems.⁷ This is very true too.

c. *The main historical stages of technological development.* Dr. Skrbina points out the existence of two successive stages or ages in the development of human technology:⁸

i. *Anthropogenic Era:* From about 2.5 million years ago to about 1200 A.D. In it, according to the author, humans still controlled consciously and voluntarily, to a great extent, the development and use of technology, it being generally at their service, and not vice versa. It has two substages:

- *Foraging Era:* From the emergence of *Homo* genus to about 10,000 years ago. Technology was very simple, human groups were very small and their social organization was very simple too. Human beings controlled technology individually to a great

⁶ See, for example, pages 62 (commenting on E. Chaisson) and 202.

⁷ For example: "Higher levels of structure order and organize lower levels—sometimes benignly, sometimes destructively, but always with a loss of autonomy for the lower orders and a gain for the highest" (page 81).

⁸ Pages 205-208.

extent. As its name suggests, it was constituted by primitive nomadic hunter-gatherer societies.

- *Human Era*: From the emergence of agriculture to the invention of the mechanical clock. Technology was still relatively simple and not very autonomous, though it was more elaborated than in the previous stage, and human groups were larger and their social organization was more complex. Humans still controlled technology to a great extent, but only collectively, as societies, not individually. The societies representative of this era were ancient, preindustrial civilizations. According to Dr. Skrbina, this stage implied the “highest” degree of human development, the best era of our history.

ii. *Technological Era*: The technology in this era is advanced and complex, it has a high degree of autonomy and technological determinism, groups and social organizations are even larger and more complex. In this era humans hardly have any chance to influence technological development and, in turn, their life conditions are ever more determined and restricted by it. It is the industrial civilization. It has two substages:

- *Industrial Era*: From the emergence of the mechanical clock to some undetermined point in the near future. In this stage humans are still necessary, though less and less necessary, to maintain the technological system (as cogs of it). This somewhat still trammels the development of a completely autonomous technological system and, with it, the reign of an absolute technological determinism. It is the current stage (we are in its final phase). It is the last stage in which humans can still have some chance of voluntarily preventing or diverting the course of technological development.

- *Autogenic Era*: In this stage, machines or technological systems would become completely autonomous and self-reliant and they wouldn’t need humans in order to operate and continue developing themselves. Then, humans would be utterly unnecessary for the growth and development of the technological system. Technological determinism would be absolute, humans would have lost all autonomy and technology would go on developing and advancing autonomously without taking them into account and utterly rampaging Nature on Earth.

While there are some details that are more than questionable in this scheme (from the names given to some stages⁹ to some of their respective exact real limits and chronologies¹⁰; to the author’s progressive interpretation of some of these stages or of the historical process generally), *broadly* it refers to important stages and traits for understanding the process of the historical development of technology.

The author makes it quite clear these three ideas in the book (especially in the few pages of its second part where Dr. Skrbina openly expresses *his own* ideas), even though the author, bragging of using a “synthetic” and “normative” method¹¹, allegedly superior to what he calls “technological thought” (basically the so-called “analytic thinking”),

⁹ Weren’t hunter-gatherers “human” too?

¹⁰ Why the mechanical clock? Why not the steam engine, for example?

¹¹ Page 11.

often seems to make everything physically and “metaphysically” possible to complicate their explanation, as we will see below.

4. The flaws:

The flaws of this book range from some concrete errors that are relatively unimportant for the fight against technological development¹² to some more general and very doubtful aspects that are crucial for the correct understanding of the technological system and that, thus, could have serious strategic and practical consequences for trying to achieve its elimination. Here I am going to just comment on the most remarkable of the latter:

a. *Synthetic approach*. The author, in this book, says that

“Thinking analytically -technologically- about technology is self-serving and intrinsically biased. It will drive us to forgone conclusions: that technology is a set of tools at our disposal, constructed by mankind, for the betterment of mankind; that it is largely a benign force in the world; that it is morally neutral, in that it may be put to good or bad use depending on the intentions of the user; that it is a humanizing power, a bringer of prosperity and cultural advancement; and perhaps most importantly, that it is devoid of metaphysics. ... To think clearly about technology, to see into its depths, we must attempt to transcend the very process of thinking that a technological society imposes upon us as the only acceptable means.”¹³

And he states that

“Proper thinking about technology must be truly metaphysical, in the classic sense. We need not abandon analysis, but it must be incorporated and subordinated within a broader, visionary, even speculative framework. In contrast to the present, formal, analytical metaphysics, I propose something rather different: *synthetic metaphysics*. Where the analytic approach is concerned with definitions and formalisms, synthetic metaphysics seeks to illuminate the essential nature of a thing. Analysis deals with abstract concepts, synthesis with the real world. Where analysis strives to dissect and atomize, synthesis seeks to integrate and capture wholes. This is not just a rehash of the old debate over reductionism versus holism, but rather a move to -or better, a return to- creative, organic and visionary approaches to metaphysical issues.”¹⁴

And he adds that, contrary to the analytic approach, allegedly “mechanistic, objectivistic, industrialist and technological”, [1180] the synthetic approach “avoids foregone

¹² Just to mention some of these, without commenting on them: according to the author (who brags about his training in physics), the law of gravitation can be defended (Page 279); Karl Popper and Thomas Kuhn demonstrated that every scientific theory is “intrinsically false” (Page 140, Note 14); and two of the *main* moral conflicts in modern society are to cheat on exams and “sexual temptations” -pornography, infidelity, etc.- (pages 256 and 261-262).

¹³ Page 10.

¹⁴ Italics in the original. Pages 10-11.

conclusions about objectivity, neutrality, and verifiability -all built into the structure of conventional analysis.”¹⁵

According to the author,

“We no longer seek fundamental principles but rather only detailed analyses of specific applications. . [T]echnological thinking . ‘prefers’ that we focus on specifics, on details, on structure and function. . Technology in the physical world is about machines, devices, invention, amusement, communication, information, profit -and power. . there is nothing ‘behind’ technology, nothing to see. . But we must ask: Is this so? Is it not true that all phenomena possess an inner or intrinsic nature, subject to some kind of guiding principles? I believe it to be self-evident that there are such principles of nature, principles that account for the order and complexity of the cosmos.”¹⁶

However, notwithstanding all this, it is difficult to know *exactly* what Dr. Skrbina is referring to with expressions like “synthetic metaphysics” and “technological thinking”. Admittedly, I have never been able to know well what the expressions “analytic thinking” and “synthetic thinking” *exactly* mean (and what not), but I have already seen too many people of dubious intellectual kinds ranting and raving about “analytic thinking”, mechanism, objectivity, etc. -and trying to justify all sorts of stupid things, divagations, fantasies, logical incongruences and emotional outrages this way- to trust Dr. Skrbina when he tries to sell us these synthetic metaphysics which in many respects sound too familiar to us, and smell fishy.

Furthermore, it seems that, according to Dr. Skrbina, it is impossible, for example, to reject the moral neutrality of technology without, in turn, rejecting objectivity and verifiability as criteria of knowledge. Or that thinking that technology is nothing other than a set of tools, inevitably implies believing that technology is good and/or neutral. Or that, according to him, not attaching a lot of importance to looking for what is beyond the physical world or attaching it to definitions and to logical congruence, necessarily implies being in favor of technology. And, on the contrary, it seems that everyone who tries to get an all-embracing or general idea of things, to see beyond the immediate and concrete, to find general principles and patterns and to take into account the interactions that exist among the elements that constitute the different sets which make up reality, can never be mechanist or objectivist, much less think that technology is not neutral, according to the author. However, the author’s way of presenting this issue about the possible approaches or ways of thinking, forcing all of them to fit into either one or another of just two opposite types, perhaps is ironically too simplistic, not very “holistic”, and maybe even “technologic”, according to his own criteria.

In fact, after reading his book, it seems that such a “synthetic and normative” method consists to a great extent of disorderly mixing descriptions and evaluations without differentiating or separating them; of not taking definitions much into account;

¹⁵ Page 11.

¹⁶ Page 13.

of extracting false conclusions based on a bad use of logic; and of not attaching a lot of importance to the rigor, order and consistency of one's whole set of theories. The author's "synthetic" way of thinking leaves much to be desired and is full of ambiguities, non-sequiturs and tacit assaults on rationality, as we will see.

b. *Ambiguity and incongruence in definitions and in the use made of them.* One of the typical defects of many philosophical texts is their ambiguity and incongruence when offering and handling definitions of key terms used in them. Too often the authors of these texts either offer and use several different (or even mutually contradictory) definitions and notions of such terms, or simply they don't even bother about defining them explicitly. So, it is actually impossible to know for sure and exactly what they are referring to each time they use certain key terms, and the result is ambiguity, confusion and misunderstanding. Thus, key terms like "technology" or "nature" are handled throughout the book with senses that are obviously different from the definitions at first offered by the author.

When defining the concept of "nature", the author regards himself as a monist, stating that Nature is everything that exists and that everything that exists is part of Nature, regardless of whether it is made by humans or not, because humans, according to the author, are *always* part of Nature too, and thus, always according to the author, their works are also part of Nature (i.e., they are "natural").¹⁷ To the author, dualism (the stance opposite to monism, which in this case would separate the human or the artificial from the rest of reality) is a very serious philosophical error,¹⁸ but he actually doesn't say exactly why, except for offering some confuse explanations about the utility of making distinctions (like natural/artificial), on one hand, and about the metaphysical invalidity of making them, on the other.¹⁹

The way the author argues in favor of monism is in fact based on logical fallacies and, despite what he seems to think, it raises some questions which are difficult to

¹⁷ For example: "[R]eality is wholly natural. There is no supernatural realm. My entire approach here is naturalistic and monistic. ... Everything that exists in the physical realm is, in the deepest sense, natural- that is, of nature. All technology is natural. Of course, we commonly think of it as artificial, something made by human art or craft. But to state the obvious, humans are natural beings, and thus our doings and makings are also natural, that is, nature acting on nature" (page 16); and "I am not [comfortable with incongruous dualisms]. The only valid distinction here is that man-made technology is second-order nature, 'nature-made nature' ... and that this fact distinguishes technique from first order nature, the *Techne-Logos* as manifest by universal processes. There is a distinction, but it is one of degree and not kind" (page 192).

¹⁸ "At a fundamental level, I take it that the cosmos is a unity. The ultimate metaphysical description of the universe must refer, in the end, to a single substance, principle, or entity. We simply have no rational basis for assuming an ontological duality or plurality. Problems of interaction, generation, and explanation seem insurmountable for any nonmonistic schema. Monism is parsimonious, and it is elegant" (page 16); and "The concept of multiple realms opens up a variety of interaction problems and arguments from parsimony that are avoided under a monistic scheme" (page 75).

¹⁹ For example: "I don't deny the reality of such distinctions; they are obvious and have been a focus of study for at least two thousand years. I do deny, however, that they are of metaphysical significance" (page 17).

answer. I am just going to mention here the most evident of them: Is the same “to have a relationship with” or “to come from” as “to belong to” or “be the same as”? Why does something which has been created by an element of a set (Nature in this case) necessarily have to be a part of this set in turn? If, as the author states, everything, even modern technology, is natural, then the effects of modern technology on the non-artificial world would be natural too. But then, could we regard modern technology as detrimental *for the natural world* if, according to the author, both, technology and its impacts are part of this same natural world too? In order to be able to evaluate, one must first be able to *qualitatively* differentiate.

Moreover, the author seems to forget almost completely such “monist” definitions in practice, because in many other places of the book he reasons tacitly assuming a completely different and much more usual and widespread notion of Nature, the dualist one, namely Nature taken exclusively as that what is not artificial or as that what is not human (and thus, the idea that the human or the artificial -including 21 human technology- is different from the natural).²⁰

Regarding the concept of “technology”, something similar happens. The author himself doesn’t define explicitly the term “technology”; he just shows the definitions given by others, without making it very clear if he agrees with them or to what extent. In addition, in this book, depending on the page and on the convenience of the author, different notions of technology are handled, and not all are mutually compatible. Without going any further, when he refers to the idea of the “Pantehnikon”, Dr. Skrbina reminds us that “technology” is just everything, that is, any real entity or process. Yet, somewhere else, the author forgets this notion and when he uses the term “technology” he refers only to that kind of technology made by humans.²¹

The author also makes a questionable use of the term “technology” when he asserts that tendriled plants use “technology” because they grasp other objects as a support on which grow, and thus, these objects are “tools” or “technology” for those plants. Or, in an even more surprising way, when he says that as plants use some nutrients to keep themselves alive and to grow, these nutrients would be “tools”, and therefore, “technology”.²²

Another example of abuse of the term “technology” and its definitions/notions is when Dr. Skrbina associates, and not only etymologically, the concept of “technology” with those ancient Greek notions of “Techne” and “Logos”,²³ which actually, in spite of

²⁰ For example: “But technology also damages *the nonhuman world of nature*” (page 79); “[T]o defend technology ... would be the height of irrationality -from the standpoint *of the individual man* or from that *of nature*” (page 152); or “Technology will accelerate toward true autonomy . as *humanity and nature* plunge toward a breaking point” (page 281). Emphasis added.

²¹ For example, in the quotation of page 79, mentioned in footnote 21 in this review.

²² Page 16.

²³ For example, on pages 9 or 119.

what the author seems to suggest, have little or nothing to do with today's conventional notion of "technology" (basically a set of tools).²⁴

The issue about the different definitions and notions of technology could be discussed for long, but suffice it to say that, deep down, in this book, it boils down again to an idle, forced and confusing use of language and thought, and to the fact that the author commits some clumsy uses of the most elementary logic. For example, he mixes up having relationship with being identical, vagueness with generality, some with all, etc.

And the same applies to other concepts, such as that of "rationality", about which one can't definitely know if, according to the author, it is a typical concept of "technological thinking" or rather the opposite.

In other words, the author uses terms, concepts and definitions, thought and language in a negligent manner, and besides, tries to justify such an inability using suspicious philosophical theories about the evilness of "technological thinking" and the goodness of synthetic metaphysics.

c. *Anthropocentrism*. In the book, in practice, ambiguity about anthropocentrism prevails. Theoretically, the author has a stance contrary to it.²⁵ And, precisely because of his metaphysical monism, he seems to defend that if, according to him, there is no ontological distinction between the human and the non-human, and everything is just natural, then one can't regard the human as superior to the non-human either.²⁶ Yet, on several occasions, the author ignores his own argument. For example, when he refers to the problems that technology causes, he separates the problems caused to 28 humans from those caused to the non-artificial world.²⁷

Furthermore, Dr. Skrbina seems to have the idea that the non-human world on planet Earth is merely an "environment" which surrounds human beings and their works 29

(and thus, these would be the *centre*, surrounded by such an environment).²⁸

²⁴ After having read the whole book, with many of its pages devoted to the notions that ancient Greek philosophers had about what they called "Techne" and "Logos", one is left without even knowing well what these terms (especially "Techne") mean to the author; this is so partly because the author often doesn't even explain concretely and clearly what ancient Greeks meant by these terms (much less what the author thinks about those ancient meanings), partly because each Greek philosopher defined and understood these terms differently; and partly, one suspects, because there is not much to understand behind all this metaphysical clouds of smoke. Simply put, Greeks invented vague, ethereal and metaphysical concepts and theories to refer to that which the limited development of the science of their age didn't allow them to really understand and know in a non-speculative manner. Just like other humans have done at any other time, including nowadays.

²⁵ "Despite what we may wish, and despite our religious anthropocentrism, the universe does not exist for our sake" (Page 286).

²⁶ "Metaphysics seeks general principles that cut across categorical distinctions ... When we introduce distinctions of human/animal or artificial/natural, we have to justify those distinctions in a non-question begging way. This is a difficult task at best. . From a metaphysical standpoint, therefore, we ought to be radically non-anthropocentric" (page 17).

²⁷ For example, in the quotations mentioned in footnote 21 in this review.

²⁸ See, for example, the quotation which the footnote 33 refers to in this review.

Another example: the author regards what he calls the “Human Era” as the best time for humans because they were the owners of the world and they dominated it at their whim.²⁹

In all of these cases, Dr. Skrbina is actually attaching too much importance to humans and their works, and playing down the non-human world. The idea that one extracts regarding this issue after having read the book, is that while Dr. Skrbina, theoretically, wants to preserve the natural and wild world and to favor its recovery, *at least sometimes* he values it only or mainly in so far as it is useful, valuable or necessary *for human beings* and, too often, he overlooks the intrinsic value of non-artificial ecosystems (their importance *for their own sake*) and/or their value for other non-human and non-artificial beings. However much the author tries to make both things compatible, it is impossible to be a humanist without being anthropocentric.

d. *Reformism*. At a practical level, as has already been said, the book presents the hypothetical goal of making technoindustrial society go back, peacefully and in a voluntarily controlled way, to a level of technological, demographic and social development approximately comparable to that which some civilized human societies had at the end of what the author calls the “Human Era” (or at the beginning of what he calls the “Technological Era”). In fact, Dr. Skrbina, raises this possibility, the so-called “creative reconstruction”, as the only alternative to the disaster. This disaster, according to the author, would consist in either continuing the social and technological development as if nothing happens, until we enter “Autogenic Era” (with the consequent replacement -or displacement- of humans by machines and the complete destruction or subduing of the wild natural world on planet Earth), or until we end up suffering a spontaneous collapse of the technoindustrial system in some future time (probably too late for many species -perhaps, including ours- and ecosystems to survive) and bearing the consequences of Nature putting things in order again by itself (violently and ruthlessly for humans). In the author’s opinion, it seems that there isn’t any other possibility, beyond these three. He defends the first one (according to him, it would be “the best one”, because it would be neither violent nor brutal for humans).

However, Dr. Skrbina overlooks a fourth possibility: *to artificially destroy the technoindustrial system*, i.e., to cause its definitive breakdown, as soon as possible and intentionally. This possibility is, indeed, much more realistic than Dr. Skrbina’s illusory “creative reconstruction”, and it is still preferable to the other two options, because its consequences would be less disastrous for the natural world (and perhaps for humans too). Here again, instead of being really objective and sensible, Dr. Skrbina prefers to get carried away by the stream of humanistic and politically correct values, scruples and taboos that prevail in this society and, especially, in academic milieus. Particularly, by the taboo which prevents him from publicly acknowledging that most likely it will be necessary to display a very high degree of violence and of lack of compassion

²⁹ “During the Human Era, ... we ourselves were that uppermost layer of existence. ... The world was ours to do as we liked” (page 272).

in order to have some chance to definitely eliminate technoindustrial society. Reforms which are voluntarily and peacefully accepted and carried out by a majority, like the “creative reconstruction” proposed by the author, are just unfeasible. If only because neither the leaders in technoindustrial society (who would be those who would have to enforce and manage them), much less all or the majority of the people in it, are going to be willing to accept and carry out such a proposal, ever; whether by hook or by crook. And this is admitted even by the author himself.³⁰ So any reformist proposal, such as the “creative reconstruction”, even if its application were feasible, would end up either failing even before starting (it wouldn’t be taken sufficiently seriously) or actually end up being neither as peaceful nor as voluntary, nor as minimally destructive or brutal as the author tries to make us believe (in the improbable case where it were accepted by society’s leaders, they would have to carry it out by force and against people’s will).

Moreover, we can wonder if the very goal of the “creative reconstruction”, that is, going back to a level of social and technological development similar to that of the late European Middle Ages or early Renaissance, is something as good and great as the author attempts to make us believe; or simply whether or not it is attainable. And the answer to these questions is simply “no”. Regarding the first question, it is “no” because the level of technological and social development that the author takes as reference and proposes as a goal, is far away from being the ideal for humans and for Nature. As the author himself admits, human nature is adapted to a nomadic huntergatherer life, in very small and quite mutually distant social groups, in huge areas constituted by wild ecosystems.³¹ This is the way of life that our species has had throughout the greatest part of the time that it has existed, and it is the way of life to which natural selection was adapting us during this vast period of time. Any other way of life is too recent and, thus, more or less unnatural, i.e., our nature is not well fit for it; and this causes problems, at the human level and at ecological level. Particularly, the European civilization of the Renaissance, which the author takes as reference for the goal, was already too far away from those original conditions to which our nature is adapted.

And regarding the second question, the answer is “no” too because, although that goal certainly implies abandoning the level of the industrial technological development, to take as a goal some particular level of technological and social development, whichever it be, is absurd. It would imply having to strictly control and steer the course of such a development (in the opposite direction to the current one, in this case), and this is impossible. Systems and complex processes are greatly intrinsically unpredictable and, thus, uncontrollable. Social and technological development, at most, can be stopped and prevented from recovering (at least for a long time) through permanently disabling the technoindustrial system, but one can not steer or control its course continuously (in any direction) in order to achieve some previously determined

³⁰ “I add here that I make no claim about the actual feasibility of these actions. In fact, by any conventional accounting, they are utterly impossible” (Page 278).

³¹ See, for example, pages 95-96 (quoting and commenting on René Dubos).

kind of society. The goal must not be the “reconstruction”, or the “creation”, of any particular and predetermined type of non-industrial society, or “to produce a high-quality life for humanity within a sustainable environmental context.”³² The goal must simply be the definitive and permanent (or at least lasting) elimination of technoindustrial society. And nothing else. To pursue utopias and/or to reform the technoindustrial system (because this is what the author’s “creative reconstruction” boils down to, to progressively transforming or changing the current social and technological system by replacing it with another that is allegedly better), is something inevitably doomed to failure.

It can also be pointed out that the very proposal of the “creative reconstruction” can give us some clues about some of the author’s basic values and real motivations, as well as about some of the psychological restrictions that prevent him from completely and logically developing some of his ideas. Particularly, according to the morals that prevail in current technoindustrial society, destruction tends to be regarded as something absolutely bad; and, to the contrary, “(re-)construction” and “creation” (or “creativity”, whatever this means), tend to be regarded as good in themselves. So, in the book (and generally in his other works and public appearances), Dr. Skrbina always avoids even mentioning (much less proposing) the deliberate *destruction* of technoindustrial system as an option or goal. The author knows well that such destruction would imply paying a high cost of violence, suffering, death, material damages and losses of “cultural” or “spiritual” achievements; that all these effects are regarded as big evils in this society; and that, therefore, to acknowledge that the destruction of the technoindustrial society is a feasible option, even just speaking or writing of it (not to mention defending it), most probably would imply the end of his academic and social personal aspirations, because he would automatically be regarded as a madman and/or a pariah in those very milieus where he pretends to stand out and thrive. So he doesn’t even mention it, focusing on presenting and defending his reformist proposal conveniently named with the prudish expression “creative reconstruction” (which for the do-goodist prevailing morals would basically mean: “goody-goody”).

e. *Ambiguity towards the neutrality of technology.* In his book, Dr. Skrbina displays an ambiguous attitude toward another key concept too: the neutrality of technology (the false idea of that technology, especially modern or industrial technology, is neither good nor bad, but that its moral character depends on how it is used, on who uses it, or on for what it is used in each particular case). Throughout the entire book, Dr. Skrbina repeats relentlessly that technology is not morally neutral and, thus, he presents and defends several, more or less appropriate arguments against the idea of the neutrality of technology. Yet, on two occasions he clearly says that “technology is not evil.”³³ How, from a stance contrary to the neutrality of modern technology, can the author

³² Page 170.

³³ Pages 266 and 272.

say that technology is not evil without, in turn, undermining the 35 congruence of his own stance? If it is not evil, what is it then? Good? Neutral?³⁴

f. *Progressive and politically correct values.* Deep down, Dr. Skrbina's values don't seem to be very different from those soft conventional values that prevail in current technoindustrial society. In addition to what has already been pointed out above about the demonization of violence and destruction, we can see that the author on several occasions justifies his stances and proposals on the basis of two of the most beloved values of the politically correct, humanistic prudery: justice and compassion. According to him, deep down, the main problems of modern technology boil down to the fact that it prevents social and "environmental" justice -whatever this latter term means- and it undermines "compassion" in individuals.³⁵ A detailed explanation of why this so spineless and sappy stance is nonsense would make this review even longer. Suffice it to say that justice and compassion aren't always so good, so necessary or so important, and that much less can they be used as a basis for any stance that actually pretends to be contrary to technoindustrial society. *At most*, these values can be important in certain kinds of relationships among individuals, but they have nothing to do with the relationships that human societies have with non-artificial ecosystems, and they have nothing to contribute to these relationships; or to the solution of the actual problems that are inherent in modern technology. Not to mention the practical inefficiency of preaching ideas and values, in general, in order to seriously influence the development of a social and technological system which actually and mainly is determined by objective and material factors.

Likewise, in spite of the fact that, at first glance, Dr. Skrbina seems to be an author who is critical towards technological development, and that he even pretends to have a regressive vision of *some part* of history,³⁶ throughout the entire book, Dr. Skrbina defends, more or less implicitly, a progressive stance, that is, a stance based on the idea

³⁴ It is also possible that the author here was referring to the fact that technology has not evil intentions, that is, that the bad caused by technology is not made because it has bad will, but it is just an unavoidable and unintended effect of the functioning of a blind and unconscious system. "[Technology] is powerful, and it is indifferent, and that is why it is dangerous" (page 266). "[Technology] acts not out of malevolence, but out of necessity" (page 272). But then, Dr. Skrbina would be contradicting his own panpsychistic stance which states that technology has conscience and will and that, thus, it acts intentionally (see below in this review).

³⁵ For example: "[R]apid-fire media tools, such as Twitter, could damage the brain's 'moral compass' by circumventing needed time for moral reflection. This in turn could lead to a sense of indifference to human suffering" (page 262). But couldn't there also be a moral sense beyond and even apart from the sensitivity to others' suffering? Real morals can not be reduced to compassion, and sometimes they can even be contrary to it.

³⁶ For example: "By the 13th century, Western civilization had peaked; it then entered a period of gradually accelerating decay. Certainly by the onset of the Industrial Revolution -say, 1750- human culture definitely began a marked and steady decline, worldwide, in all areas of endeavor. The overall trend, for hundreds if not thousands of years, has been downward"

of progress³⁷ and in favor of it. For example, the author mentions, and in this case he himself seems to assume it too, the belief, typical of some ancient Greek philosophers, that things evolve to “the better”, from the “inferior” to the “superior”, that is, in that the evolution of things has generally followed an “upwards” trajectory”.³⁸

Equally progressive is his idea of that ancient civilizations were the height of human social, cultural and “spiritual” development, and that this was something good. This implies believing in that such human societies and cultures *progressed*, moving from allegedly worse levels (the pre-civilized ones) to other allegedly better levels (the civilized ones).³⁹

In relation to the previous, it is certainly sad to see how the author tries to justify what can’t be justified: that the cultural and “spiritual” “achievements” of ancient civilizations were not only something good in themselves, but that they were more important and valuable than that what was lost or prevented because of them; that the costs that humans and Nature paid for these “achievements”, so beloved by humanistic intellectuals like the author, was worth being paid. Thus, for example, the author tries to downplay the human sacrifices that some of these ancient civilizations carried out, saying that the supposed psychological effects on the people of modern societies (basically rendering them insensitive or less compassionate), allegedly caused by the *fictional* violence in movies, videogames and television, would be much worse than the *very real* thousands of deaths (and the subsequent terror) caused by human massive sacrifices in those ancient civilizations.⁴⁰ And he isn’t even fazed! Here (and not only here, unfortunately), Dr. Skrbina used such intellectually poor arguments that it is not worth refuting them, because they don’t even stand on their own.

And of course, as was to be expected in a teacher of (the history of) philosophy worth his salt, the author romanticizes ancient societies (especially Athens), regarding them as an example of how high a degree of social, cultural and “spiritual” development can be achieved with quite a low technological level.⁴¹ Of course, one has to wonder whether Greek slaves (a great part of the population in that time and that

³⁷ Progress is the belief in that social and cultural historical processes of development (including technological development), and even the evolution of the natural world, always or at least generally imply absolute improvements. The advocate of progress (the progressive) usually regards that which is modern or new as better than that which is ancient or old, just because the new thing is more recent than the old one.

³⁸ For example: “Evolution ... works towards ‘the better’” (page 46); or “Where we are not ascending, we are declining. This is a law of evolution” (page 289).

³⁹ And, by the way, this implies another contradiction in the author’s rhetoric, which on one hand says that our nature is adapted to the nomadic hunter-gatherer way of life but, on the other, says that ancient civilizations were the best societies for humans to live in and for humanity to realize its potentialities (for example, pages 206, 236, 269-270, 272 or 273).

⁴⁰ Page 274.

⁴¹ For example, regarding ancient Greeks: “Their cultural achievements were numerous and well known: art, architecture, literature, and philosophy, among others. This group consisting of only 30,000 Athenian citizens, created one of the peaks of human existence, using, by our standards, the most primitive of tools” (pages 125-126). Here, the author (conveniently?) forgets the slaves, metics (resident

society) or the thousands of individuals sacrificed by the Aztecs before the arrival of the Spaniards might have seen things in quite a different way than how Dr. Skrbina does from the comfort and security of his university office in the United States of the 21st century. Not to mention the ecological damages caused by those civilizations and their “achievements”, such as the decimation of the woodlands and the subsequent soil erosion in Attica, in times of ancient Greeks, which the author himself mentions in the book.⁴²

One must also point out the collectivism and the subsequent disdain for the autonomy of individuals that this pro-civilization stance implies. As has already been said, the author believes that in the “Human Era” technology was still, to a great extent, controlled by human societies, though not by the individuals that constituted them. In fact, most individuals in such societies would have lost their autonomy (freedom) to a great extent. However, the author regards this era and these kinds of societies as the height of the realization of the potentiality of humanity, thus putting the collective “achievements” in these societies ahead of the individual losses in them. In practice, what Dr. Skrbina suggests with this, is that what is important is the development of the societies, and that the autonomy of the individuals who constitute them lacks value compared to this development. According to this mindset, individuals would be mere usable and disposable tools for attaining such “achievements” (ironically, a quite widely spread and accepted -i.e., politically correct- idea in the allegedly hyperindividualistic current society, especially among university humanistic academics).

g. *The “Panteknikon” thesis.* One of the central goals of this book, if not its main purpose, is to publicly present and spread the “Panteknikon” thesis. As has already been pointed out, this thesis states that everything is “technology”. The universe as a whole is a “technological” system and all the dynamics of it are a “technological” process, always according to the author. Here, again, Dr. Skrbina shows off his lack of intellectual rigor in applying the most basic reasoning. Particularly, the “Panteknikon” thesis is nothing but a paradigmatic example of the so-called fallacy of composition, in which a part is taken as the whole. In this case, from the real existence of technology in some species, the author extracts the conclusion that technology is a universal phenomenon, which is manifest in every aspect, process and element that constitutes the universe, as well as a “natural force” underlying it as a fundamental and deep push (a push that, according to the author, makes “technology” emerge everywhere). In order to justify this fallacy, the author forces and stretches the meaning of the term “technology” beyond that what is reasonably admissible. According to him, given that we can’t exactly limit the creation and use of technology only to certain species (because, depending on how one defines technology, this creation or use would include a bigger or smaller number of species), the best thing we can do is to assume that this

aliens), women and other “second rate inhabitants”, whose numbers, quite larger than those of “citizens”, were counted in the tens or hundreds of thousands in this very time and society.

⁴² Page 238, quoting Plate.

limit doesn't exist at all and that everything in the universe (be it an animal or not, be it a living being or not) is, creates and uses "technology". Obviously, if one stretches a concept (be it that of technology or any other) enough to comprise anything, one ends up being able to include everything within this concept. But, when one acts this way, words or expressions end up meaning nothing at all, and thus they are not useful for really, properly and efficiently communicating any more.

In fact, the author makes an illegitimate absolute generalization (everything is "technology"; "technology" is everywhere) from the observation of a few cases (the supposed use of "technology" by some living beings). This is an example of the so-called problem of induction. It is true that often, because of a lack of knowledge of every existent or possible particular case, we have to base our thinking on inductive generalizations, but even so there are some limits and rules, not everything goes. Yet, the case of Dr. Skrbina's "Pantechnikon", with its ambiguous and elastic use of the definitions of technology in order to make them include everything and justify his generalization, smells too much of abuse.

h. *Panpsychism*. Not much different from the "Pantechnikon" is the case of the so-called "panpsychism". It seems that the author is currently one of the most prominent advocates of this metaphysical theory.⁴³ According to the panpsychistic thesis, everything has intelligence, conscience, subjectivity, sensitivity, mind, spirit and/or will, from the universe as a whole to every part that constitutes it, at every possible level of complexity. Thus, panpsychism would be a modernized form of the traditional pantheism and/or animism. And I say "modernized" because the author tries to refer to modern science (or rather to its limitations) to justify this thesis.

Dr. Skrbina uses such a theory to state that the technological system has intention and conscience, and that these are nothing but a concrete expression of the mind of the universe, arguing that (and here is where the author gets up again to his old tricks, making a quite peculiar use of "logics"), given that science always has had serious trouble in defining and delimiting what conscience or mind is, everything has conscience, and conscience or mind is everywhere. If the reader doesn't grasp how this logical leap can be done (from the lack of definition of a concept to its generalization), that makes two of us.

According to the author, the effects of technology (especially digital or computer technology) on the human minds are caused precisely by this, by the fact that both technology and our minds are expressions of a mind that underlies the entire universe. The fact that both the human mind and computational systems are systems which work exclusively by processing, emitting and receiving information, and that this makes the latter interact and influence to a greater extent and more intensely the former than other non-computational technological systems, seems to be too much of

⁴³ See, for example, the section "Contemporary" for the item "Panpsychism" on the *Wikipedia*: [<https://en.wikipedia.org/wiki/Panpsychism%23Contemporary>][<https://en.wikipedia.Org/wiki/Panpsychism#Contemporary>.]

a straightforward, materialistic and prosaic explanation for Dr. Skrbina. He had to summon the universal and metaphysical “Logos”, of course.⁴⁴

The defense of *teleology* or finalism made by the author in the book is closely related with panpsychism too. According to Dr. Skrbina, the processes that take place in the universe, not only follow a trajectory and an orientation (towards more complexity), but they are the expression of some pre-established purpose or end. By whom? By reality itself which, as we have seen, has a conscience and a will of its own, according to the author. And, of course, the technological system also has a mind, a will and an intelligence and consciously pursues its own purposes.⁴⁵

From time immemorial, human beings have projected their own psychical traits onto the rest of reality. This seems to be a universal feature that only some humans, only sometimes and only partly, manage to overcome through a rational and conscious effort. Obviously, the author is not one of them; on the contrary, however much he says that what he does is not “careless anthropomorphism”,⁴⁶ he is precisely trying to theoretically justify such a projection.

i. *Practical uselessness.* Finally, in addition to the very questionable validity and respectability of the content of the author’s metaphysical philosophy, one can raise serious doubts about its practical utility for calling into question and combating the technoindustrial system. Dr. Skrbina tries to make us believe that metaphysics is something of the utmost importance in order to properly confront the problem of modern technology,⁴⁷ but what else can we expect from a teacher of (the history of) philosophy who precisely earns his living -and lives for- writing and discussing on such issues?

In fact, *beyond some basic minimum degree*, metaphysical philosophy not only lacks practical utility, but it can bring about many drawbacks, deflecting attention and energy from the practical issues on which those who pretend to seriously combat the technoindustrial system should focus; attracting dreamer, fantasist and unpractical people to this cause; and repelling those who are really down-to-earth and try to achieve real and practical results. Of course, everybody assumes and has some basic metaphysical ideas or stances, whether he acknowledges it or not, and as far as possible, one should be clear in his mind about these stances and make them clear to others

⁴⁴ For example: “Technology is logos, and logos is something mind-like. Modern information technology in particular is a deep manifestation of the universal Logos; it is both a result of and embodiment of cosmic reason. As a concentrated and intense form of mind, information technology cannot but have psychological effects on us-who are, ourselves, also particularly concentrated and intense forms of mind” (page 261); and “All creation is, in fact, a reification of mind. This cannot but produce a psychological effect” (page 287).

⁴⁵ For example: “[F]rom the pantechanical perspective, the technological system is a functioning collective being, with an intelligence, will, and value system in place. These qualities are an outgrowth of a universal Panteknikon that is teleologically oriented. Hence our man-made system acts with purpose, towards specific ends, and in its own perceived self-interests” (page 218).

⁴⁶ Page 284.

⁴⁷ For example: “I believe that only by grasping the metaphysical nature of technology can we construct an adequate response” (page 170).

before trying to join together with them to work against technoindustrial society, in order to avoid incongruences or incompatibilities in rhetoric and in practice. And, of course, every individual and group oriented to an end has an ideology, whether they acknowledge it or not. And this ideology is, more or less consistently, based on some philosophical principles, which they will release and defend more or less explicitly when they spread and apply such ideology in practice. But *beyond this*, to think or debate about metaphysics is utterly futile, or even counterproductive, in practical terms.

After having read the book, one is left with the suspicion that the author's main goal isn't precisely to physically eliminate modern technology, but rather to speculate, to ramble and to merely propose some theories, ideas and philosophical stances; and with it, of course, to make a name for himself in some academic (and perhaps "political"⁴⁸) milieus. However, ironically, the author seems not to understand that the only thing that the unnecessary insertion of metaphysical, anti-materialistic and bizarre theories, such as panpsychism, teleology or the "Pantechnikon" thesis, and his intellectual scattering, disorder and lack of rigor in trying to explain and criticize technological development, are going to bring him is discredit in the eyes of the most sensible and rational public.

⁴⁸ For example, perhaps, in some environmental segments that are relatively critical towards technology, like eco(philo)sophy, deep ecology, neoluddism, the "Greens", primitivists, etc.

Brave New World, 1984, and the Techno-Industrial System

Karagam (April 2021)

Introduction

Brave New World and *1984*, two dystopian novels of the first half of the twentieth century, put forward two different visions about what the social consequences of the great technological explosion that started with the Industrial Revolution might be. Although George Orwell portrayed a very pessimistic picture in his *1984*, he had a fundamentally positive view of technology; his starting point was the classical Marxist understanding of technological development. Thus, the terrible, totalitarian-collectivist society we see in *1984* is not a result of technological development itself, but a result of its distortion by a totalitarian dictatorship. Aldous Huxley, on the other hand, was concerned with the consequences of technological development itself and its inner logic. There is nothing in *Brave New World* that deflects technological development from its natural course. In *Brave New World*, technology itself, via the developments regarded as “progress” today by the technological propaganda, gives rise to the horrible form of society depicted in the novel, creating another dystopian society. In this paper, we will compare these two different visions about industrial society with the present technointustrial system.

The Society of 1984, Dynamics of Its Birth and Its Qualities

When we look at what Orwell says in *1984* through Goldstein (one of the characters in *1984*), we see that his philosophy of history consists of the classical Marxist class war: History progresses through the conflicts between different classes in society. Since the Neolithic Age, the structure of human societies has been almost the same with their main lines; there are three classes in societies: the lower, middle, and upper classes. The upper classes try to maintain their position, the middle classes try to replace the upper classes, and the lower classes aren't in a position to think of anything since the members of these classes spend most of their time engaged in daily physical labor. In certain historical situations, the middle classes overthrew the upper classes. In doing so, they received the support of the lower classes by instrumentalizing concepts such as freedom, fraternity, and equality. But when middle classes replaced upper classes, they transformed themselves into new upper classes; new middle classes formed in

their place, and thus societies returned to their usual three-layered form. However, the Industrial Revolution, for the first time in history, has created a possibility to change this hierarchical structure of societies.

According to Orwell, the Industrial Revolution has made it possible for the first time in history for every social class to live in material prosperity by increasing tremendously the production capacity of the society. Thus, for the first time, the lower classes, which constitute the largest segment of human societies, will no longer need to spend most of their lives in ordinary daily work to gain their basic physical needs (food, shelter, fuel, clothing, etc.). The fact that everyone in the society can have basic material needs without expending great physical effort will ensure that the living standards of people of all walks of life converge at a level that was formerly possible for only upper-classes. When people's material living standards converge in this way (when machine production allows everyone to own electrical appliances, cars, personal bathrooms, televisions, and the like), inequalities arising from material conditions within society will become meaningless. Everyone, including the lower classes who are freed from material constraints, will be able to develop themselves culturally and cognitively. Social conflicts arising from the problem of sharing the scarce resources of the society will disappear as a result of the realization of material abundance through technological development, and thus the hierarchical structure of human societies will also disappear. Orwell explains this as follows:

[I]t was also clear that an all-around increase in wealth threatened the destruction - indeed, in some sense was the destruction- of hierarchical society.¹²

For if leisure and security were enjoyed by all alike, the great mass of human beings who are normally stupefied by poverty would become literate and would learn to think for themselves; and when once they had done this, they would sooner or later realize that the 2 2 2 privileged minority had no function, and they would sweep it away.

So Orwell sees technological development as positive and good on its own. The material abundance that technological development would bring will make people more cultured and knowledgeable, people who become cultured and informed will not want a useless ruling class above them, and they will eliminate this "parasitical" class, and thus "freedom"³ will become possible. This is the classical Marxist progressive view of technological development. The danger Orwell sees about the future is that this

¹ 1984, Part II, Chapter IX.

² Ibid.

³ Orwell defines freedom in a leftist and humanist framework. According to this, freedom is to be free from natural physical hardships thanks to the blessings of a human society that has subjugated wild Nature, and not being under political pressure, not being exposed to discrimination (class, race, religion, etc.), and with an income that will make it possible to enjoy the blessings of human society.

positive dimension of technological development can be distorted by totalitarian dictatorships.⁴⁵

What Orwell points to as the reason for the emergence of the totalitarian society in *1984* is the reaction of the upper-classes to the technological explosion that started with the Industrial Revolution which supposedly makes possible the abolishment of the hierarchical structure of societies. The ruling classes in *1984*, by seeing this aspect of technological progress, tried to prevent the emergence of the results described above. In order to achieve this, they had to prevent the productive capacity of society from accumulating material wealth by building a totalitarian system. In doing so, they would annul the “liberating” power of the machine and ensure that people remained ignorant and poor. The two methods they used for this were the continuation of a constant state of war between neighboring states, thus preventing the accumulation of the produced material wealth, through its destruction in wars; and banning thought and expression to eliminate empirical thinking and creativity, thus halting technological progress after a 5 certain level.

As a result of this deliberate policy put into effect by the ruling classes, the material living conditions of the society in *1984* are very bad. The environment in which people live, their homes, streets, and the offices they work in are falling apart physically. Elevators do not work; electricity is not available during the day and often goes off at night. Monotony and mediocrity prevail in the cities, there is no vitality in society. There are constant shortages in consumer goods; coffee, sometimes soap, or razor blades cannot be found at different times. The use of consumer goods is bound to quotas, and they are offered to people within certain limits; they have very bad quality. Food has no taste, and the ingredients are pretty poor quality and terrible.

The political system in *1984* is a single-party dictatorial regime with a socialist and collectivist ideology. Economic activity is completely controlled by the state. Society is divided into three classes: At the top are the internal party cadres. These are the people who form the ideology and determine the policy to be followed. They live in a special district of the capital and their living conditions are much better than the rest of the population. Below them are ordinary members of the party which constitute the middleclass of society. At the bottom are the “proles,” who make up 85% of society. The living conditions of the proles are very bad; they live in a terrible physical environment. (Their conditions can be compared to the 19th-century British working class at the

⁴ He seems to have written *1984* as a warning for this threat. Many features of the totalitarian dictatorship described in the book were borrowed from the Stalinist dictatorship that prevailed in the Soviets at the time of the book’s writing. It seems that Orwell saw the spread of this political system around the world as the greatest danger in the future.

⁵ Orwell explains the inability of totalitarian bureaucrats to reduce technology to a point before the Industrial Revolution as follows: Reducing the technology to a point below the Industrial Revolution, and most importantly, halting the development of military technology would greatly disadvantage the states which do these things in the competition with other states and would result with the destruction of the ruling classes of those states.

beginning of the Industrial Revolution.) Their sole concern is to survive day by day. Their lives consist of food, drink, football, and beer. Since they live in constant misery and poverty, they aren't able to think and act on more serious issues like the hierarchical structure of society, political events, the way of life they have, etc. Because, as stated above, the main purpose of the ruling classes in *1984* is to keep the physical conditions of the majority at a poor level, thereby preventing them from developing themselves cognitively and culturally and having sophisticated demands.⁶

The political system in *1984* strangles society, trying to control everything by physical pressure. There are no democratic elections, and a one-party dictatorship is a sole hegemon. Management techniques like constitutional rights, separation of powers were abolished. Free expression of ideas is never allowed, and thoughts are shaped by methods based on physical force. The media is under the control of the party. Everyone has a telescreen (an electronic device like a television) that must be present in their home, and it is strictly forbidden to turn it off. The party uses this tool both for propaganda purposes and to monitor and listen to the people. However, contents that are being broadcasted using this tool are dull and monotonous compared to the television broadcasts of today. They don't have the function of today's mass media that bewitches people with fun, violence, curiosity, sense of belonging, sex, and the like, and makes them forget the dull, monotonous, and unsatisfying dimension of their own lives. Its function is to carry out the propaganda in a vulgar and blunt way and detect those who are beginning to show signs of dangerous thoughts and attitudes. But when thought control and surveillance are done in blunt and obvious ways, as in *1984*, they create enormous pressure and tension on people, and the accumulation of these pressures and tensions can have worse consequences than benefits for the social machine. Therefore, today's techno-industrial system has developed more subtle methods for the control of thought and behavior. This electronic device, as Orwell imagined it, would be much less effective than today's methods of electronic thought control. The society of *1984* controls people more through physical pressure rather than efficient and intelligent propaganda.

The world is divided among three super-states: Oceania, Eurasia, and Eastasia. These states are in a constant war with each other. The war between super-states in *1984* isn't a total war like the wars in the first half of the 20th century, and it does not play a decisive role in the daily life of the citizens of these states. Since these states are enormous in terms of geography, population, and economy, they cannot beat each

⁶ We see that the masses of today's techno-industrial system, which have far better material conditions than the lower classes of *1984* on average, have a fundamentally similar attitude. Contrary to the beliefs of the progressives, the consequences of machine technology reducing physical labor and increasing material well-being didn't turn out to be people's dedication to "loftier" and "creative" activities. On the contrary, the indolent lifestyle created by technological development drags people into meaninglessness, creates psychological problems and dissatisfaction, and to suppress these problems to some extent, people immerse themselves in hedonistic pleasures: consumption, movies, TV series, computer games, pornography, etc.

other, and the state of war continues chronically. As we have already mentioned above, the ruling classes of these states continue to wage war deliberately to keep the material well-being of society in a miserable condition. Orwell wrote *1984* during the Second World War; this might induce him to think that war would become an ordinary feature of the great power relations in the future. But the historical developments in the real world were quite different in regards to warfare. The advances in weapon technology, especially nuclear weapons, made the war between great powers extraordinarily costly; we haven't witnessed an armed conflict between great powers since the end of the Second World War. On the other hand, states have not become cultural and economic autarchies, as described in *1984*. On the contrary, the development of transportation and communication technologies has accelerated the economic and cultural integration of the parts of the globe and created an integrated global system with a connected physical infrastructure.

Both *Brave New World* and *1984* emphasize the need for complex social systems to weaken small-scale communities. The loyalty and devotion of people must be directed to the social system itself rather than to small-scale communities such as the family, extended family, local communities, tribes, etc. so that there is no concentration of power anywhere that can be a rival to the central authority of the system itself. The result of the disintegration of small-scale communities is that the power of the social system as a whole increases, but individuals become weak since they are isolated from each other.

Per the above-mentioned need, the ruling elite in *1984* tries to eliminate family ties, friendships, and other connections among people. Children are raised in a way that would make them loyal to the system itself, accepting its values and ideology rather than the values of their families. That is accomplished by indoctrinating children from an early age in various educational institutions (educational camps, schools, kindergartens, etc.). That prevents the families from instilling thoughts and behaviors in children that are contrary to the values of the system. In particular, the party doesn't want children to be loyal to their parents, and it wants them to be constant spies on them. Children thus become a real trouble for their parents: vicious informants who have penetrated the interior of their homes.

Another method used to weaken family ties in *1984* is the suppression of sexuality. Orwell mentions two reasons for the attempts to completely suppress sexuality in *1984*: The first is to prevent men and women from approaching each other and forming intense bonds through sexuality. The second is that the energy that would accumulate in people thanks to the suppression of sexuality would be used to create a more intense bond with the regime and its ideology. In *1984*, the party tries to reduce sexuality to a strictly functional and mundane activity of procreation which is necessary to perpetuate the social system.

Orwell describes a society in *1984* that puts its members under enormous pressure from every angle. People live in poor material conditions, and the party strictly dictates and controls what they wear, what they say, how they work, their sexuality, and

even what they think. Orwell viewed all these as necessary for future technological societies that would also like to keep their hierarchical structure. Because he believed that technology, when left to its natural course, would play a supposedly liberating role. According to Orwell's socialist point of view, the "perfect" society would be born through increased material well-being created by technological development. Machine production would absolve people from the necessity of pursuing fundamental basic needs, and thus, would make it possible for all segments of society to cognitively and culturally develop themselves. Thus, the classless, "free" society dreamed of by the leftist ideology would become possible. Only a totalitarian dictatorship could maintain modern technology and hierarchical society together. Orwell imagined an industrial society that would suppress thought and expression, would have miserable material conditions, and would try to maintain interior political stability by xenophobic hatred and war. And his counter-ideal would be another industrial society that has been dreamed of by progressives since the advent of the Enlightenment: A society in material abundance that would give its members the "freedom" to consume this material abundance, a society that would be democratic, peaceful, and constituted by culturally sophisticated members.

But the technological advancement itself -as the *Brave New World* correctly predicted, and the development of the present techno-industrial system has demonstrated-, despite the improvement of material conditions, the increased consumption possibilities, the sexual permissiveness, and the permission about expression and thought, destroys the possibilities of real freedom.⁷⁸

The Society of *Brave New World*, Dynamics of Its Birth, and Its Qualities

Huxley's *Brave New World* shows us what might be the consequences of the advancement of technology with its inner logic—without being derailed by an evil dictatorship.

Brave New World takes place in 632 after Ford. The person who is alluded to here is Henry Ford. Ford is a sacred persona and worshipped religiously in *Brave New World*. The importance of Henry Ford in the real world is that he used in his automobile factory the first moving assembly line. That was a revolution in industrial production methods. Huxley regarded this as one of the most consequential factors that would shape the future of human societies. And indeed, the assembly-line method has formed the basis of industrial mass production and consumption. In this production method, the commodity to be produced is standardized; complex jobs are divided into smaller mechanical processes, and standard products are produced on assembly lines where unqualified workers work. The tasks these workers do are reduced to sim-

⁷ The role that Huxley and Orwell assigned to sexuality in their dystopias is diametrically opposite to each other, and Huxley's utopia predicted the role that sexuality plays in the current techno-industrial system much more accurately. We will return to this topic in the sections where we discuss *Brave New World* and the present techno-industrial system.

⁸ Real freedom has nothing to do with doing what the system allows; it consists of having the possibility to meet one's fundamental needs with one's own abilities and initiative, individually or as a member of a small group.

ple mechanical movements. This method brought an enormous increase in production capacity and consequently created the necessity of mass consumption. Industrial mode of massproduction and the necessity of consuming the commodities it produces created a closely knit cycle of production-consumption and shaped the characteristics of the way of life in industrial societies: Individuals turned into the mechanical pawns of a great collective in working life, and consuming the products created by this mode of production in their “spare time” became the sole meaning of their lives. Mechanical work and hedonistic consumption became the gears of an engine that feed each other. In *Brave New World*, Huxley shows us the logical consequences of this process.

The society of *Brave New World* is a project realized after world economy and human civilization nearly collapsed because of a war. It was recognized that the re-occurrence of a similar danger could only be prevented by a scientifically planned universal society organized on a global scale. To prevent social and economic crises and new wars, it was necessary to build a global society that would provide stability. And to achieve stability, members of this social system should be completely integrated and adapted to it; and feel happy and satisfied with it. For this purpose, people should live in an environment where they didn't feel any “negative” emotions. To this end, the society of *Brave New World* satisfies the physical needs of people (it is enough for individuals to fulfil the simple roles for which they have been produced), and they spend their lives with entertainment and consumption. The psychological problems like boredom, depression, meaninglessness that this kind of life brings are tried to be eliminated by sex (its reproductive function is suppressed to make it a simple hedonistic pleasure), consumption of commodities, holidays, and “feelies” (an electronic entertainment technique quite similar to today's electronic entertainment like movies, TV series, music, videos, etc.) People's minds try to be kept constantly occupied with fun and pleasure to suppress thought and negative emotional states. In case people still feel gloomy despite all these diversions, a psychoactive medicine called soma comes into play. Thus, the society of *Brave New World* tries to keep its members in an uninterrupted euphoric mood to ensure social stability. People are conditioned biologically in such a way that they won't have any desires that this society cannot fulfill, and any other desires they have are going to be fulfilled by society. They eat and drink as they want and have sex with whomever they want. They don't have worries about competition and success because their place in society is predetermined; they are produced according to the role they will take in this society. They don't have families, wives, and children; therefore, there are no intense emotional states such as sacrifice, jealousy, and longing that these close relationships can bring. They indulge in hedonistic pleasures after doing a monotonous job that doesn't require any talent and initiative.

Assembly-line production is also used for producing human beings. People are designed according to the roles they will assume in society and produced as mass commodities. People who are going to make the most monotonous physical tasks are produced by the Bokanovsky method as exact same copies. Huxley emphasizes here the killing of individuality by the mass production-consumption cycle. People who make

the exact same mechanic movements while working try to divert themselves with the exact same entertainments: “Feelies”, soma, orgy-porgy. The standardizing force of *Brave New World* is shown by the Bokanovsky groups: Mass-produced, genetically identical groups of people without individuality.

The sexual politics of *Brave New World* is completely different than 1984. In 1984, the aim is to suppress and reduce sexuality to a social task undertaken solely for reproduction purposes. In *Brave New World*, the aim is to turn sexuality into an act done solely for pleasure and entertainment by separating it from reproduction. Sexuality is encouraged from a very early age. Society promotes contraceptive methods and educates women thoroughly about them. Having an active sexual life is the expectation of society from people. But relationships should be short-term, and people need to change partners frequently. Family has been completely eradicated in *Brave New World* because new generations are produced in factories; people don’t have kids, and relationships are short-term. The society of *Brave New World* solved its need (a need every complex society faces as we mentioned above) of eliminating small-scale communities permanently by severing sexuality’s ties with reproduction, producing people in factories, and thereby eradicating family. In *Brave New World*, nobody belongs to a particular person, but everyone belongs to everyone else. The individual is a part of the social collective from his production to his death. Spending time alone, doing something solitary is regarded as a very bizarre and anti-social attitude. It is expected from the individual to lose himself in the social collective and surrender all of his uniqueness.

Huxley shows that those consequences of technological development regarded generally as “positive” (an increase of material “wealth,” enlargement of consumption, and the eradication of negative emotional states by various entertainment techniques and drugs) are not at all positive; and the veritable consequence of all is the reduction of life to a drug-induced dream without any meaning. Because in such a life as it is in *Brave New World*, where all the desires of people regarding physical necessities and pleasures are satisfied by the social collective without a meaningful effort from their part, where people live in constant fun under the perpetual pleasurable stimulus, and where all the deep personal relationships have been eradicated, nothing remains that people achieve with their initiative and capabilities, and experience as their own doing. The feeling of meaninglessness and boredom this life creates is tried to be alleviated by “feelies”, sexual orgies, psychoactive drugs like soma, etc. In this society, people are never alone. But the relationships between people are reduced to such a shallow state that they don’t include any strong emotions like jealousy, rage, passion, longing, love, devotion, etc. In such a life, there is no place for desire, ambition, longing for success, and victory. That means the eradication of all the possibilities of freedom and meaning of life.

As we saw, Orwell thought that the consequence of the increased material welfare would be the enlargement of the cultural and cognitive capacities of the masses—the supposed result of technological development when it is not perverted by a totalitarian

bureaucracy. But Huxley demonstrated that despite the increased material standards, it is still possible to keep the majority of people ignorant and shallow; and the crowds, when “emancipated” from the harsh conditions of life, wouldn’t automatically aspire to “high” culture and consciousness. Because in a society like *Brave New World* where ability, initiative, strong human emotions, and life itself have no meaning, and human beings lead an idle, purposeless life, what does “high” culture and consciousness signify? Huxley answers this question in his novel with a discussion about Shakespeare. Shakespeare produced much deeper and more sophisticated works of art than what is prevalent in *Brave New World*. Because in Shakespeare’s time, the relationships among people were dense, life was an adventure with its hardships and dangers. It was necessary to struggle to achieve success and be satisfied. And what makes life meaningful and worth living is precisely this. Otherwise, if life was as it is in *Brave New World*, people would numb their consciousness instead of cultivating it—in the hope of forgetting this meaningless life.

Huxley puts savage reservations against *Brave New World*. Technologically advanced *Brave New World* society has spread to every part of the world that it is possible to exploit its resources economically; the only remaining areas that it hasn’t subjugated are the savage reservations. The technological level of the human communities that live in savage reservations isn’t advanced. People here are horticulturalists. There are no centralized, bureaucratic structures, and the external world isn’t managed and regulated by large organizations. People have a more individualistic character. They don’t belong to an enormous community but belong to themselves and their loved ones. People here are not the manufactured products of society, and they continue to reproduce naturally. Wild animals continue to live in these reservations freely. Savage reservations are the only remaining antithesis of the planned, regulated, secured, anti-septic, and controlled society of *Brave New World*. These are the places where Nature, outside the control of the technologically advanced human civilization, has its own will.

Therefore this region is an antithesis to the *Brave New World*, and the latter’s evil character can be understood and revealed only by comparison to a place outside of its control. But Huxley doesn’t romanticize this place; because what makes *Brave New World* a nightmarish dystopia is its seemingly “perfect” qualities, and savage reservation should be shown with all of its positive and negative aspects. Diseases, old age that can’t be hidden by technological tricks, the necessity of physical effort, wars, struggles, etc. are the parts of the life of the savage reservation. Real freedom comes with a cost, and that is precisely what makes it possible.

The Present Techno-Industrial System

The modern industrial system was born when human societies started to use the energy of fossil fuels. Steam engines presented the power concentrated in coal to human societies, and the internal combustion engines have done the same thing for the oil. The enormous amount of energy concentrated in fossil fuels created an explosion in human societies and increased the production, communication, and transportation

capacities exponentially. First railways, and after that motorways, made it possible for the industrial system to reach ever-wider areas. The utilization of engines working with fossil energy in the factories made possible industrial mass production. Enormous machines working with the power of oil have made it possible to excavate vast quantities of minerals and process them in quantities that weren't possible before. Railways, trucks, large container ships, gigantic machines used in construction and production have changed the face of the earth and societies. The industrial system started to spread rapidly by subjugating and replacing wild Nature. The technoindustrial system established itself entirely on a global scale during the second half of the 20th century; and thanks to the advanced communication and transportation technologies, it has become an integrated whole spanning the entire planet despite containing different communities with different political, institutional, and cultural backgrounds.

This highly complex and worldwide social system forces people to live in ways and environments that they are not evolutionarily adapted to. The techno-industrial system is a social order with an enormous population, in which urbanization and specialization have gone to extreme levels. It needs an iron discipline and an advanced collective organization to function. People need to carry out the tasks (jobs) which are shaped for the needs of this rigid organizational framework and behave accordingly. But these tasks aren't satisfactory for the great majority; they reduce people to pawns without initiative, simple cogs in a giant machine. Constant growth and technological development inherent to the techno-industrial system create a world in which times pass quickly, and space shrinks rapidly. This creates in people an emotional state of uncertainty, insecurity, and anxiety. The collective character of the system destroys the small-scale communities. *Homo sapiens* are adapted evolutionarily to live in and identify with these kinds of communities. The destruction of small-scale communities produces the paradoxical isolation of the modern individual. Rapid destruction of the natural ecosystems and replacement of these with artificial settings trap people in synthetic environments to which they aren't evolutionarily adapted. Therefore, the living conditions that the techno-industrial system creates aren't the ones that people will accept naturally. The system needs to convince and enforce them with various techniques (propaganda, motivations like material wealth and status, techniques of surveillance and physical enforcement, etc.) to make them behave according to its requirements.

The methods *Brave New World* uses to shape human behavior start with the production of people according to the roles and place they will occupy in society. The present techno-industrial system doesn't intervene (yet?) directly to the human genome because the information regarding the biological factors shaping human behavior is limited today. The consequences of this kind of direct intervention would be quite different than what was intended and might create more problems than benefits for the system. For this reason, the techno-industrial system, instead of direct biological intervention, uses some other methods to alleviate the dissatisfaction of people and control their behavior. These intervention methods consist of two main layers. The methods that

are in the first layer and target people en masse at large⁹ are quite similar to the ones in *Brave New World* : Electronic entertainment (internet, music, TV serials, movies, pornography, etc.), hedonist pleasures (commodity consumption; tourism sector with its restaurants, all-inclusive hotels; etc.), hobbies, pseudo-satisfaction of the need of belonging to a reference group by surrogate methods (football supporters' groups, social activism, political parties, etc.), absorption of the rebellious feelings or even rendering them beneficial to the system by the leftist ideology, and when all these are not sufficient, implementation of psychoactive drugs.

In the techno-industrial society, the first layer of control techniques (entertainment, distraction) is both possible and mandatory. It is possible because this social system can sustain physically its enormous population by only using a minute fraction of its energy and material resources. After satisfying the most basic physical necessities of its members, it can still allocate resources to the control techniques that are in the first layer. But these "entertainment" functions of the system should not be seen as redundant expenditures that could be diverted to more "necessary" or "useful" outlets. They have their "rightful" place in the huge social machinery and they are as essential for its functioning as the other indispensable sectors like manufacturing and agriculture. With the advancements in food production technologies (agricultural machines, artificial fertilizers, pesticides, etc.) it became both possible and mandatory to construct a huge manufacturing sector beside and on top of the agricultural sector. With the advancements in manufacturing technologies (moving assembly lines, computer-controlled automation, etc.) it became both possible and mandatory to construct a service sector beside and on top of the manufacturing sector. But the different sectors of the techno-industrial system are not superficial and redundant additions to more useful and necessary functions. Each technological advancement in a particular sector makes other advancements in other sectors necessary for its functioning. In order to feed billions of people, industrial agricultural techniques are essential. For industrial agriculture, tractors, combine harvesters, artificial fertilizers, pesticides, etc. are necessary. Agricultural machines need oil to work, the oil needs to be produced with complex extraction and refinement procedures. These machines and their spare parts can only be produced in huge manufacturing plants on a mass scale. Artificial fertilizers and pesticides can only be produced in chemical plants. All these industrial manufacturing activities require control, supervision, human resources and financial management, judicial representation, public relations, advertisement, etc. These are done by engineers, accountants, finance and human resource specialists, lawyers, advertisers, etc. The service and manufacturing activities of the techno-industrial system amass people in big cities. Motor vehicles are necessary to commute these people to their work and bring food from the rural areas to the cities. This creates the necessity

⁹ With the developments of computer technology (like machine learning algorithms and ever more powerful processors), the system has also started to target people individually with its methods of enchantment. Contents that are shaped for specific individuals in shopping websites, video streaming websites, etc. are becoming the norm.

of automobiles, trucks, trains, etc. This enormous transportation network, to function, needs controls, regulations, certificates, rules, etc. In order to construct and sustain the infrastructures (roads, bridges, energy networks, communication networks, etc.) necessary for all these activities, taxes should be collected and spent properly. State structures, with their bureaucracies and institutions, are necessary to implement and supervise all these investments.

Therefore, the techno-industrial system is a giant machine with all of its constituent parts connected and they need one another to function. People need to fit in a rigidly defined slot in this giant machine. The slot they fit in requires them to follow strict regulations, workplace rules, stringent schedules; these force them to do their jobs in ways that are designed according to the needs of the social machine. This situation reduces people to mere pawns without initiative. They are not in a position to define their own goals, and pursue these goals with their own autonomy and capabilities. And the tasks they do are completely severed from the necessities (like food and security) that are most important for them. They are highly specialized tasks bordering on absurdity without any relation to the practical necessities of life. This lack of initiative, lack of autonomy, the inability to use one's own capabilities to satisfy the most important practical necessities is disrupting a vital biological need called the power process.¹⁰ The disruption of the power process creates feelings of boredom, meaninglessness, and psychological problems like depression, anxiety, guilt feelings, eating and sleeping disorders, etc. These problems make people less effective in the roles they assume in the social machine and even induce them to anti-social behaviours that affect negatively the efficient functioning of the system. The first layer of control techniques (entertainment, distraction) of the techno-industrial society is necessary to alleviate these psychological distresses and keep people functioning by drowning their negative emotions under a ceaseless barrage of sound and images. For this reason, those control techniques are useful for the system to limit the prevalence of these behaviors that would be greatly inimical for its functioning. Of course, these mechanisms of diversion can't bring complete satisfaction to people's lives and can't eliminate all the damaging behaviors. Psychological problems like anxiety, stress, boredom, emptiness, meaninglessness, depression continue to afflict individuals.

The society of *1984* crudely controls human behavior by demonstrating its physical force in every moment, and it doesn't drown dissatisfaction under the "entertainment" as *Brave New World* and the present techno-industrial system do. Because as we have seen previously, Orwell thought that material affluence and resulting free time (being free from the labor of basic physical necessities) would bring the elimination of the hierarchies and the realization of "freedom." Orwell's *1984*, in order to preserve the hierarchical structure of the society, controls people with direct physical coercion, and doesn't use the diversion techniques that are in the first layer in our classifica-

¹⁰ For the definition and a more detailed discussion of the power process, see: Theodore John Kaczynski, *Industrial Society and Its Future*, paragraphs 33-37.

tion. The modern techno-industrial system combines the Orwellian (physical coercion, technological surveillance, crude propaganda) and the Huxleyan (distraction through entertainment and physical pleasures) controlling techniques. Because under the first layer of control techniques that we have mentioned above, there is a second layer of control techniques consisting of physical coercion methods that are even more efficient and more ubiquitous than Orwell imagined. It might be that an “ordinary” member of the techno-industrial society doesn’t face this physical force directly in his daily life. But every member of the system feels this omnipresent physical force and surveillance capacity at every moment of his existence. The modern individual is surrounded first by a wall of distraction, constant stimulation, and brainwashing techniques. If these are not sufficient to channel his behavior to desired limits, then there are more concrete methods to incapacitate him.

Technological development consolidated the monopoly of physical violence at the hands of the centralized governments and created the enormous surveillance, control, and physical coercion capabilities of the modern states. Smaller political entities (feudal principalities, chiefdoms, or any other small-scale groups that the central organization of the society couldn’t control) dissolved in bigger centralized political structures and individuals remained alone and isolated face to face with the Leviathans that monopolized the violence nearly completely. This process was nearly consummated at the end of the 19[th] century in terms of hegemony over lands when the centralized state organizations instituted their control over most of the surface of the World. In the continents like North and South America, Australia, and Africa where there were very limited or no central state authorities until that time, industrial societies established their hegemony by the end of the 19th century. The places where their direct hegemony couldn’t reach yet are climatically and geographically unsuitable remote places like the polar regions, deserts, rainforests, and remote parts of the oceans (like in the *Brave New World*). With the technological advances of the 20th century, the intensity of their domination on the areas that they control increased. Modern transportation technologies have given them the ability to intervene anywhere in the world very rapidly. Advances in communication technologies make it possible to screen and control virtually every aspect of the lives of their members, and the mass media tools like radio, television, and the internet make it possible to inculcate to the masses the necessary values and ideas.

The destruction of the small-scale communities by the centralizing power of technology created the modern individual’s paradoxical isolation. Today, a great number of people live in giant metropolises surrounded by huge crowds, but in practical terms, they are alone and isolated. The only way for people to come together and make a meaningful and practically important activity is to make it through the channels of the social system. This means that to make something practical they should join a large collection in which their contributions would have only a minuscule meaning and assume the roles that had been already defined by the system. Friendships they have

outside of this working collective tend to be only for the entertainment purposes with which they pass time. So, they feel alone, isolated, and powerless.

Nearly all the moments of the life of the modern individual are monitored and recorded. Surveillance cameras are practically everywhere; his financial status, the things he buys, his assets, education, abilities, capabilities, etc. are all in the databases of the system. The information the system has on its members is increasing even further with the advances of computer technology. People have started to voluntarily present who constitutes their social circle, what they do in their daily lives, where they go with whom, what they buy, what they watch and listen to the system. Thanks to new computer technologies like machine learning algorithms, it is possible to evaluate all these vast data in order to lay bare people's desires and fears, i.e. their whole character. Thus, the system's physical coercion and brainwashing techniques have increased to a level at least as high as *1984*, if not more.

A common feature that we see both in *1984* and *Brave New World* is that new generations are socialized from a very young age directly by the social collective. Childhood is the period when people can be socialized (inculcation of the values, ideas, and behaviors that society deems as appropriate to its members) more effectively and successfully. For this reason, in both novels, raising children from a very early age under the control of the system is very important for implanting the desired values and ideas to people. Current techno-industrial society, consciously or unconsciously, is demonstrating a similar tendency in socializing children. The destruction of subsistence home economies by the Industrial Revolution and the mass exodus from villages to cities resulted in the shattering of large family structures and reduced the family relations to the level of the nuclear family. The accelerated and more intense integration of women into the techno-industrial society since the middle of the 20th century resulted in the loosening of the nuclear family ties and submitted children from a very young age to the institutions of the system (private or public kindergartens, and the other higher level educational institutions). Apart from these institutions, the other factor which is very important in shaping the world-views, ideas, and values of the new generations is mass communications media (nowadays especially the internet). Therefore, family or the close circle of people around it has virtually no impact now determining the ideas and values of children. The indoctrination process of the technoindustrial society is reminiscent of the hypnopaedia of *Brave New World*. Individuals who have been bombarded from birth by the system's values from various channels start to internalize them unconsciously.¹¹

The present techno-industrial system's attitude towards sexuality is similar to *Brave New World's*. Especially after the advances in contraception techniques in the sixties,

¹¹ Some of them internalize these values so intensely that when they try to rebel against the established order they can't think of anything else and use the system's values to rebel against it. For a more detailed discussion of this subject, see Karaçam, "Leftism, Techno-Industrial System, and Wild Nature" and Último Reducto, "Leftism: The function of pseudo-critique and pseudo-revolution in techno-industrial society".

traditional conservative attitudes regarding sexuality mostly have died, and the connection between sexuality and reproduction has been partly severed. This has weakened the nuclear family relations in addition to the extended family ties that had already been mostly severed. As a result, sexuality was partially released from the responsibility of child-rearing; and it became possible to engage in sex, without the fear of consequences, solely for pleasure and fun. Thus, sexuality joined to other hedonistic pleasures (consumption, holidays, products of the culture industry, etc.) which are being used to relieve the discontents that the system's pressures create on people.

In 1984, the party forces people to have telescreens in their houses primarily for listening and watching them, secondarily for propaganda reasons. In the real world, people have put televisions in their houses on their own. Of course, in the real world, the system doesn't use television to listen and watch people. It functions mainly as a propaganda tool. But this propaganda, at least in western countries, isn't as obvious, blunt, and dull as in 1984. The principal function of the television in techno-industrial society is to fill the void and the meaninglessness that the modern lifestyle leaves behind. The system makes electronic entertainment a necessity for its members by the lifestyle it implies. Remaining alone by himself and his thoughts in tranquility is a traumatic experience for the modern individual. For this reason, he tries to drown his thoughts under electronic stimuli by staying in an artificial universe isolated from reality. He tries to forget the purposelessness and futility of his existence for a time under the bombardment of the sound and spectacle of electronic entertainment; he tries to feel alive by watching movies, serials, and other television programs. Because of this, propaganda can penetrate deeper into his psyche and be much more efficient since it functions via a powerful and intense urge. Since the modern individual passes most of his time under a constant bombardment of intense stimuli that keeps his brain continually occupied, his worldview, ideas, and values are shaped -for the most part- inside the periphery of the ideology of the techno-industrial system. Because the electronic media (both in its fiction and news forms) propagates, explicitly or implicitly, the opinions and values of the techno-industrial system—apart from some shallow daily political differences.

Advances in computer technology considerably ameliorated electronic entertainment and manipulation techniques. With the exponential increase in the capacity of the processors and the speed of the internet connections, image and sound broadcast became mobile (smartphones) and started to invade every nook and cranny of the people's lives that were impossible to reach before. Internet media makes it possible to create addictive states intentionally on people: Web page and application designs that are deliberately designed to trigger the expectation of new surprises on people (dazzling icons, gripping notifications, etc.) and more importantly, inducement of a false feeling of belonging provided by the pseudo communities of the social media (thereby the system gives to the isolated modern individual a false feeling of belonging to an imaginary and unreal community.) These techniques create real physical addictive states in people by triggering the reward system of the brain. Thus, people are

addicted to the entertainment and propaganda of the system with the literal meaning of that word.

As we have seen in this paper, the ruling classes in 1984 try to hold back intentionally material standards of life to preserve the hierarchical structure of the society. For this reason, the lower classes and the middle classes of 1984 live in terrible physical conditions. On the contrary, *Brave New World* is a society that has high material standards of living. Developments in the techno-industrial system have produced conditions that are, on average, more similar to *Brave New World*. And different nations inside the techno-industrial system take as their ideal a society similar to *Brave New World* : A society that exploits the “resources” of the planet and enslaves wild Nature to increase the standards of living (i.e.: individuals would have more to buy if they resign their autonomy to the system and live inside the boundaries drawn for them.)

In this context, we have witnessed since the end of the 19th century and the beginning of the 20th century that machine technology has decreased the need for physical labor, Fordist mass production has filled daily life with numerous commodities, motor vehicles have connected remote places by speeding up the transportation, living spaces have been increasingly artificialized by concrete structures, and people are increasingly incarcerated in a virtual world (this is called communication) with the advances of the electronic and computer technology. The present techno-industrial system utilizes these developments to keep its members (whom it forces to live in conditions that they are not evolutionarily adapted and whom it still needs as laborers and consumers) functional.

But of course, this parasitic and hedonist lifestyle that the techno-industrial system offers is only possible by the relentless exploitation of the Earth’s resources. To sustain this lifestyle, enormous amounts of material and energy are necessary, and what the system does to procure these is disrupting the functions of the biosphere that sustains life on Earth. The consumption of a considerable amount of fossil fuels in such a short amount of time on geological terms has changed the chemistry of the atmosphere. This causes climate change and it is a disaster for wild Nature. Procuring minerals that are necessary to produce the commodities of the technologically advanced consumer society is poisoning the land and the water. Plastics, essential components for many of the products of the techno-industrial system, have penetrated every nook and cranny of the biosphere and are displacing the building blocks of life. To feed the population that is increasing exponentially, millions of square kilometers of land have been transformed into agricultural lands. The destruction of millions of hectares of wild ecosystems to artificially produce plants is causing land erosion and depletion of the freshwater resources; and pesticides are destroying insect populations. Armed with the power of modern technology, the fishing industry is literally emptying wildlife in the oceans. The invading species, which are transported to different geographies through the supply chain of the global economy, are destroying wild ecosystems. With this relentless attack on wild Nature, the technological civilization is pressing on and disrupting the

biospheric cycles, and it is possible that a global collapse of the biosphere's functions *i i* 12 that sustain complex life on Earth eventually happens.

The changes that the technological development has induced on the societies have proved Huxley to be more accurate than Orwell. It has been demonstrated that technological development, even if it is not misled by a totalitarian bureaucracy and creates material prosperity, is incompatible with real freedom and human dignity because of its internal dynamics. But it is not certain that the future social consequences of technological development (in terms of "material prosperity" or the institutional structures of societies) will be similar to what we have witnessed until now. The necessity of the system to restrain its activities that go beyond the boundaries of the biosphere may result in a restriction of the permissiveness it grants to its members in terms of consumption and entertainment. It may have to strictly ration the burden that its members bring on the biosphere and to do this, it should have to intervene in their lives in a much more authoritarian way. Moreover, the depletion of so far abundant energy, food, and material resources may create a deficiency in its ability to distract its

Apart from the reactions that the techno-industrial system's functions create in wild Nature, the advances in computer technologies can also produce deep changes in the relations between the system and human beings. The democratic structure (separation of powers, determination of the executive branch with universal suffrage, and constitutional rights like freedom of speech, right to a fair trial, etc.) and welfare practices (retirement, weekly and annual holidays, trade union rights, free health and education services, etc.) of the western societies became prevalent during the 19th and 20th centuries when human labor was at the center of the system's functions. It was crucial for the system to pay attention to the needs of the masses since it was dependent on their labor power. The great masses of working classes who undertake the system's functions were integrated into the system by democratic management techniques and welfare state practices. Two tendencies that are being produced by computer technologies (artificial intelligence and robotic technologies) might alter this relation between the technological system and human beings. First, computer technology is decreasing the need for human labor. A useful analogy for thinking on this tendency is Hans Moravec's "landscape of human competence:"

Computers are universal machines, their potential extends uniformly over a boundless expanse of tasks. Human potentials, on the other hand, are strong in areas long important for survival, but weak in things far removed. Imagine a "landscape of human competence," having lowlands with labels like "arithmetic" and "rote memorization," foothills like "theorem proving" and "chess-playing," and high mountain peaks labeled "locomotion," "hand-eye coordination" and "social interaction." Advancing computer performance is like water slowly flooding the landscape. A half-century ago it began to drown the lowlands, driving out human calculators and record clerks, but leaving most of us dry. Now the flood has reached the foothills, and our outposts there are

contemplating retreat. We feel safe on our peaks, but, at the present rate, those too will be submerged within another half-century.¹²

Shedding of its need for human labor by the advancements of computer and robotic technologies might reduce the system's sensitivity towards the humans' needs and desires and might harden its attitude towards them. Management techniques (representative democracy, constitutional rights, etc.) and welfare state practices (retirement benefits, trade union rights, annual leaves, indemnities, etc.) might be transformed into a more authoritarian and ungenerous nature as human labor becomes more and more redundant. There are some signs in the United States indicating that this trend has started already¹³: since the middle of the 1970s, despite the continuous increase in labor productivity (which measures the value of workers' hourly output) the compensation (which includes wages and benefits) that labor force gets from this remains stagnant; since the mid-1970s, the fraction of national income going to labor (this includes anyone who draws a paycheck) instead of capital is decreasing; labor force participation is declining since its highest point in 2000 ("labor force participation rate rose sharply as women flooded in the workforce, but the percentage of men in the labor force has been in constant decline since 1950, falling from a high of about 86 percent to 70 percent as of 2013. The participation rate for women peaked at 60 percent in 2000; the overall labor force participation rate peaked at about 67 percent that same year"¹⁴); the US economy is losing its ability to create new jobs; income inequality is acceleratingly increasing; job market polarization is increasing (job market polarization is "the propensity of the economy to wipe out solid middle-skill, middle-class jobs, and then to replace them with a combination of low-wage service jobs and high-skill, professional jobs that are generally unattainable for most of the work-force."¹⁵)

Second, computer technology is increasing the system's ability to track people, manipulate them, and control their behavior. The system has the technical ability now to track people in their daily lives, register their shopping habits, their circle of friends, whether they obey the traffic rules, etc. on an individual basis, and computational ability to transform this vast amount of data into useful information. Facial recognition and big-data analysis technologies based on machine learning algorithms are being used to track individuals, discourage harmful behavior, and foster or enforce useful behavioral habits for the social collective. A concrete example of this trend is China's Social Credit System. With this system, individuals will be scored and categorized

¹² Hans Moravec, "When Will Computer Hardware Reach the Human Brain?" *Journal of Evolution and Technology* (1998), vol. 1.

¹³ See "Seven Deadly Trends" in *Martin Ford, Rise of the Robots: Technology and the Threat of a Jobless Future*, Basic Books, 2015.

¹⁴ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁵ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

whether they behave according to the social norms, and will be socialized with this digital system of tracking and scoring apart from the traditional propaganda and police methods. Of course, it is not certain that this new ultra-technological method of socialization will be successful and will produce the expected results. Forcing people blatantly to certain behavior patterns might reduce their faith and commitment to the social system and diminish their motivations to voluntarily work for its benefit. Despite all of their totalitarian pretensions, socialist societies of the 20th century were less successful than the western capitalist societies in shaping the behaviors of their members and motivating them. But today's computer technology is bestowing to the claim of totalitarian control of every aspect of human life new arms, and opening to the system's control the last unreached corners of daily life. The ability to watch people individually virtually at every moment of their lives might prove to be a factor that makes it possible for the system to increase the pressure on people without giving permission in other areas (permission in consumption, permission in political and religious views, etc.) Therefore, the combination of these two tendencies of computer technologies with the problems of biospheric limits might induce the system to reduce both the bread and the circuses it offers to the masses, and it might evolve to a point more reminiscent of *1984*.

Conclusion

Complex human societies, armed with the power of modern technology, produced an artificial system that forces people to live in conditions wholly different from the circumstances in which humans evolved. It is mandatory to adjust individuals with various methods to these unnatural conditions. In their novels, Huxley and Orwell speculate about in what manner these methods may evolve. Orwell, because he shared Enlightenment's and leftism's progressive ideology, believed that technological development could produce "beneficial" results. For him, the danger lay in the possibility that a bureaucratic class might deflect technological development to suppress its supposedly "emancipatory" possibilities and use it to create a totalitarian society. On the other hand, Huxley demonstrated with *Brave New World* the logical outcomes of these "beneficial" consequences. And they would be a complete disaster for human freedom, human dignity, and wild Nature.

Ibid.

Ibid.

The transformations that technological development has induced until now in daily life and on the structures of societies in general, have proved Huxley's predictions to be more accurate. And it is also true that, in its quests of controlling human behavior, the techno-industrial system combined the methods of *1984* and *Brave New World*. But this much is clear that, regardless of its form and the techniques it uses to dazzle, control, and tame human beings, a technologically advanced society will continue to

subjugate/destroy wild Nature and destroy the possibilities of real human freedom. The solution is not to attain a specific form (democratic, liberal, socialist, sustainable, green, equal, etc.) of a technological society, but to get rid of it.

CROSSROADS: CROATIA AND THE END OF THE ERA OF FOSSIL FUELS[1,2]

Tomislav Markus

Here we deal with some general trends which characterize late industrial societies, although there are many local and regional specifics. But we must mention in some detail the country in which we live. All basic considerations also apply to Croatia, which can be considered a predominantly industrial society in which the vast majority of people are included, one way or another, in the world economy, and in which the vast majority of people either live or work or realize most of their activities in cities. Today, Croatia is no better prepared for the convergence of the end of the era of fossil fuels and climate change than any other country. Croatia currently imports over 50% of its energy needs and this will increase due to the depletion of domestic oil and gas fields. Since the end of 2008, the global economic crisis has led to an increasing drying up of foreign capital and credit, without which the Croatian economy cannot function normally. Croatia, like most European countries, is already in *de facto* bankruptcy, i.e., for a long time it has not been able to repay old loans without taking out new loans. The ruling elites in Croatia are also investing a lot of energy in the country's entry into the European Union, hoping for a suitable entrenchment in the bureaucratic structures of Brussels. This is ironic, because while the EU ship is slowly sinking, Croatia and some other countries are desperately trying to board it.[956]

Similarly to what happens in other countries, among the Croatian public there is a complete lack of understanding of the deeper causes of the crisis, confusion of causes and consequences, and the tendency to search for culprits on duty and technological wonders as salvation. Corruption scandals -which surface only in times of crisis and growing financial difficulties- have reinforced the illusion that the problem lies in the "mistakes" of the ruling political groups. Not only political elites do not have the courage to tell the truth, but they probably know nothing about the oil peak and they sincerely believe that partial suppression of symptoms -euphemistically called "antirecession measures"- may be a "solution". Instead of a sober public debate, a paranoid search for witches and the ignorance about the world crisis as the main cause of the difficult state of the Croatian economy dominate. The lack of understanding of the situation is so great that in Croatia many people think that the economic problems have nothing

to do with the world crisis and that the “recession” is just an “excuse” to hide the particular interests of the ruling groups.

Similarly to other countries, Croatia’s political elites are preoccupied with the futile suppression of symptoms and the futile efforts to restore the old failed economy. It is unrealistic to expect them to talk about an energy peak, if they know anything about it at all. The governing structures are pinning all their hopes on the recovery of the world economy, which they hope would restore the inflow of foreign capital and credit without which the Croatian economy cannot function normally. Hopes are also being pinned on the development of “alternatives”, from the sun and wind power to planning the construction of a new nuclear power plant. Croatia’s energy development strategy until 2020, adopted by the Croatian Parliament in October 2009, relies on completely unrealistic projections by the International Energy Agency (IEA) to increase energy consumption by 50% by 2030 and on available oil reserves for that increase. There can be no talk of an oil peak in such a context, but climate change, which worst projections are based precisely on erroneous assumptions about abundant fossil fuel reserves, is often mentioned instead. The law envisions the construction of new hydropower plants, the development of “renewable” energy sources and the provision of regular imports of oil and gas, all part of the industrial infrastructure, which has no future. It is also planned to launch a Croatian nuclear program with the aim of building a nuclear power plant. The law is dominated by phrases such as “energy efficiency”, “advanced technology”, “energy development”, “energy market development” and the like.¹ All of the above suggests a complete lack of awareness of the legislators about the deeper causes of the crisis and a blind faith in technological solutions in Croatia. This short-sightedness is particularly pronounced given that the law was passed a year after the escalation of the greatest economic crisis since the 1930s. The envisaged plans only would make sense with a rapid recovery of the world economy and a return to the precrisis situation. To date (summer 2010) the crisis has worsened and deepened and it has made the plans, which were completely unrealistic at the time of adoption, even more unrealistic.

For Croatia, some factors (high indebtedness, uncertain geopolitical environment) are aggravating factors, but other characteristics (low population density with a tendency to decrease; ethnic, racial and cultural homogeneity; distance from powerful states; scarcity of vital energy sources that would encourage the constant presence of great powers) could facilitate the processes of disintegration of the industrial society. Croatia’s big problem is its dependence on mass tourism as the main source of foreign exchange, which will be increasingly difficult to implement in the coming years. The insistence on expensive investment, carried out in tourism propaganda by Croatian businessmen and supported by politicians, is another indicator of a lack of understanding of the situation. Mass tourism is entirely a product of the era of cheap energy and

¹ Text of the law in: [<http://www.narodne-novine.nn.hr/clanci>][www.narodne-novine.nn.hr/clanci]. [This link doesn’t work anymore. *T. n.*]

will inevitably decline more and more as energy prices rise and employment and traffic of people and goods decline. By 2020, there will be practically nothing left of it. The tourist peak in Croatia, as well as in the whole world, was the year 2008 and since then the trend of overnight stays and the earnings will constantly decline, visible already in 2009, and in the following years more and more. The number of guests may remain high in the short term, as in 2009, but foreign exchange earnings will decline much faster due to less guest consumption. Croatia is a typical example of a small country, which achieved its rapid “development” and transformation into a consumer society overnight, after 1998, with huge foreign borrowings, which, given the relatively low energy prices and the favorable foreign loans, were still possible. The basic condition in order to regularly take out new loans is economic growth, domestic and foreign, but for this growth the basic condition is cheap energy, which is no more. With the deepening economic crisis, increasing unemployment and declining GDP, Croatia will find it increasingly difficult to repay old loans and raise new ones, and eventually it will end in bankruptcy. The good news is that the bankruptcy of the state will coincide with the collapse of the world economy in the next 2-3 years, where debt repayment will become pointless.

Croatia’s main priorities should be to reduce its dependence on tourism, reduce imports (the deepening the mega-crisis will mean a steady decline in exports in all countries, the world will become bigger and rounder again), greater economic independence (with emphasis on food self-sufficiency) and de-urbanization, especially the departure of people from Zagreb and other large areas to smaller towns and villages. The public must be made aware of the deeper causes of the crisis and get used to the truth that these are not transient “difficulties” that can be “solved” but the permanent result of a failed, short-lived consumer society. Political elites in Croatia must gradually introduce an anti-globalization policy with import restrictions and maximum stimulation of domestic production, especially agricultural production for the domestic market. Domestic jobs must be protected by state measures as much as possible and the shutdown of domestic quality companies due to the mass import of poor quality goods from Asia must not be allowed. Instead of tourism and heavy industry, the priority should be to develop organic agriculture and to reduce dependence on imported food, which will, in the coming years, become more expensive and more difficult to access from abroad.²

It is necessary to develop good relations with neighboring countries -especially Slovenia, Serbia and Bosnia and Herzegovina- which are linguistically and culturally close to Croatia, and in which the economic situation is very similar. These areas are economically oriented to each other, and economic cooperation should not - and indeed cannot,

² In early 2010, there were large peasant strikes and roadblocks due to unpaid state subsidies for agriculture. There is room for everything in the state budget, but not for a key economic factor: helping domestic agriculture, which alone can, in the coming years and decades, feed the population in Croatia. The political elites in Croatia, of course, think that this is not a problem and that Croatia will continue to import relatively cheap (or again cheap) food from abroad. This is a very dangerous misconception.

both because of the tragic experiences with the two Yugoslav states and because of the regionalist implications of the energy peak- mean closer political ties. Regional trade, unlike global trade, may have a future in the post-industrial world as well. Orientation to “alternative energy sources”, advocated by environmental associations in Croatia, is not, for the reasons stated earlier, any realistic and long-term option. In Croatia, too, in the coming decades, there will be an acceleration of demographic decline,³ de-urbanization and re-ruralization, i.e., reversing the tendencies of the last 150 years and returning most people to the villages, because in the cities they will no longer be able to survive. Croatia has favorable opportunities for this due to the low population density -which is also declining- and a lot of fertile, although currently neglected land. Due to the mass import of food in Croatia, industrial agriculture, with its mass poisoning of the soil using toxic chemicals, has not expanded much. Therefore, efforts must be directed towards the revitalization of organic agriculture, which for now can still use industrial mechanization, but in the future will require organic labor, as in the past. The one-child policy, which many countries will have to forcibly adopt due to the deepening crisis, will not be necessary in Croatia, because such a situation already exists without coercion. But a strict ban on emigration will be needed, especially for poor Chinese and similar immigrants. Croatia, as an ethnically and religiously homogeneous country, is in a relatively favorable position. The big problem is the people’s complete lack of information - among both political and economic elites, as well as among the general public, but also among academically educated citizens- in Croatia about the real causes of the crisis. This leads to even more pronounced cases of collective paranoia, especially the search for culprits on duty, than in Western countries. In academic circles, only a few people are seriously studying the growing energy crisis.⁴

This is the situation in the present and the near future. In the more distant future, Croatia, like other countries, will find it difficult to survive the end of the fossil fuel era as a complex society and a separate political entity. Several of today’s European states have their roots in the pre-industrial past, but then they could exist due to intensive agriculture and, some of them since the late 15th century, due to the influx of wealth from, and the departure of the surplus population to, the New World. These favorable conditions will not exist in the future and the existence of complex societies is very unlikely.⁵ But it is likely that they will disintegrate into several autonomous regions.

³ In Croatia -as in some neighboring countries, such as Slovenia and Serbia- there is a trend according to which declining growth is perceived as a national catastrophe, especially in rightwing (nationalist) and church circles. However, this can be seen much earlier as a boon in the context of the disintegration of industrial societies. The fewer people a country has, the easier it will be to withstand the convergence of the end of the era of fossil fuels and climate change.

⁴ Apart from A. Karlovic, significant contributions were made by Igor Dekanic (2007) and Igor Matutinovic (2008,

⁵ We talk in more detail about the reasons for the unsustainability of not only industrial, but also complex societies in general in the discussion “Slom industrijskih drustava” on our[<https://www.isp.hr/~tmarkus/>][website.]

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⁶ This link doesn't work anymore. *T. n.*

Book Review of Factfulness By qpooqpoo

February 6, 2020

Factfulness: Ten Reasons We're Wrong About The World—And Why Things Are Better Than You Think by Hans Rosling, New York, NY: Flatiron Books, 2018.

“[T]he technoindustrial system simply defines the term ‘high standard of living’ to mean the kind of living that the system itself provides, and the system then ‘discovers’ that the standard of living is high and increasing. But to me and to many, many other people a high material standard of living consists not in cars, television sets, computers, or fancy houses, but in open spaces, forests, wild plants and animals, and clear-flowing streams. As measured by that criterion our material standard of living is falling rapidly.”

-Theodore Kaczynski¹²

“People constantly and intuitively refer to their worldview when thinking, guessing, or learning about the world. So if your worldview is wrong, then you will systematically make wrong guesses.”

-Hans Rosling

One of the most dangerous aspects of the technological system is its capacity to pervert our ability to think clearly about it. Propaganda, education, various forms of organizational conditioning—all of these evolve among competing systems in a technological world. Under these conditions, systems that best manage behavior by conditioning members to have beliefs and attitudes most conducive to technical efficiency are the systems that expand in their power, necessarily at the expense of less manipulative systems. The totality of this process results in a society filled with many intelligent and well-meaning individuals who utterly fail to appreciate the full implications of a particular social system. (This is one of the reasons why astute scholars of social revolutions throughout history observe that revolutions are rarely seen coming, but after they do happen, they seem obvious and reasonable in hindsight.)³ The most pathetic

¹ Theodore John Kaczynski, *Technological Slavery*, Revised and Expanded Edition, Scottsdale, AZ: Fitch & Madison Publishers, 2019, p. 164.

² Rosling, *Factfulness*, p. 13

³ “Indeed, it becomes possible to explain the origins of a revolution in such detail that its onset seems, in retrospect, inevitable. Yet at the same time, when revolutions do occur, they usually come as

victims of this process are those scholars in the humanities who enthusiastically defend the technoindustrial system.

Hans Rosling was a member of the global technocratic elite, the pro-progress business, governmental, and academic class committed to global “development.” He grew up in mid-20th century Europe, an environment steeped in the belief in progress, a worldview he also holds. But it’s clearly failing: the industrial system has entered a period of severe social and environmental crisis and most people have grown hopelessly pessimistic.⁴ The system must act quickly to reprogram people’s attitudes lest they turn to disruptive and damaging ideas or are seduced by alternative ideologies. Enter *Factfulness*, the epitome of the latest wave of pro-technology propaganda to hit bookshelves. They all follow the same formula: marshalling a seemingly endless parade of data, together with the testimony of countless experts and institutions, to “prove” that technological progress is indeed making the world “better.” This propaganda is designed to be self-aggrandizing and self-reinforcing.

The argument is in the title: people today feel as though the world is getting worse because they have the wrong *facts*, and this is a bad thing. If people think the situation is getting worse, they may lose hope in the institutions that are promoting technological growth and “development.”⁵ But the facts don’t show the world getting worse, Mr. Rosling assures us. It is “objectively” getting better. His job is, in fact, to correct everyone’s wrong impressions with his “objective” facts. There’s just one catch, though: Rosling and the techno-cheerleaders set the standards by which to measure improvements, and these standards are based on values that are so deeply entrenched in our technological culture through generations of education and propaganda that they’re now simply taken for granted: they have become axioms. But they can no longer be. People are rightly anxious about the future as a result of rapid and uncontrollable effects of technology upon their societies and the natural world. They know that this developing “Brave New World” Rosling and his friends are ushering in is terrifyingly evil. But because they’ve been so inundated in technological cultures their whole lives, few of these people can even conceive that these negative developments are caused by technological growth *itself*. Rosling’s argument is directed toward this narrow vision, giving himself and his readers the (relatively) comforting things *they think* they want to hear: Of course! People are obviously disturbed by a *lack* of technological growth throughout the world, not the growth itself! This is a rather brilliant sleight of hand, as it deflects attention from the full social, psychological, and environmental implications of technological growth, and back onto the positive assumptions readers retain from their prior conditioning. Technology itself is thus safely guarded against scrutiny,

a complete shock to everyone...” Jack A. Goldstone, *Revolutions: A Very Short Introduction*, Oxford: Oxford U. Press, 2014, p. twenty.

⁴ Out of people in 30 countries polled by Rosling, 50% or more felt that the world is getting worse. (p.50). “I meet many such [pessimistic] people, who tell me they have lost all hope for humanity.” (p.69).

⁵ “When people wrongly believe that nothing is improving, they may conclude that nothing we have tried so far is working and lose confidence in measures that actually work.” (p.69).

supplanted by distractions. The problem is, to make this trick work, Rosling is forced to commit glaring errors and omissions. He has to cherry-pick data that support his worldview, downplay the negatives, and exaggerate positives.

To wit, he paints a ridiculous caricature of less-industrialized lifeways that relies on what can only be willful ignorance of current anthropological knowledge. Arid, as with all pro-progress worldviews, he conveniently overlooks the wide range of pre-industrial lifestyles. He focuses on low-income sedentary cultures while ignoring pastoralists, nomads, and primitive huntergatherers. We've come a long way from Thomas Hobbes's ill-informed "nasty, brutish, and short" view, but the supposedly "objective" Rosling ignores these facts. According to him, life before modern technology is by definition "misery and deprivation" (p. 31), a set of "bad old times" (p. 90) spent in "dreadful conditions" (p. 22), but thanks to modern technology, "almost everybody has escaped *hell* ...billions of people have escaped *misery* and become consumers and producers on the world market..." (p. 53). "[W]e humans have always struggled hard to make our families survive, and finally we are succeeding" (p. 55) with "fundamental improvements" due to the "secret silent miracle of human progress." (p. 51). Some lower-industrialized cultures may be severely lacking relative to "advanced" and "developed" societies today, even by nontechnological standards, but to then conclude that on the whole these developed societies are unquestionably better places to live than in all pre-industrial societies throughout history is extremely myopic. For if we consider the freedom and happiness of people, and the sustainability and integrity of their environments, then the situation changes dramatically.

"The Pirahas show no evidence of depression, chronic fatigue, extreme anxiety, panic attacks, or other psychological ailments common in many industrialized societies." ...

"I have never heard a Piraha say that he or she is worried. In fact, so far as I can tell, the Pirahas have no word for worry in their language. One group of visitors to the Pirahas, psychologists from the Massachusetts Institute of Technology's Brain and Cognitive Science Department, commented that the Pirahas appeared to be the happiest people they had ever seen."⁶

The Mbuti "were a people who had found in the forest something that made their life more than just worth living, something that made it, with all its hardships and problems and tragedies, a wonderful thing full of joy and happiness and free of care."⁷

And this only barely scratches the surface. There are plenty of examples in the historical record showing true primitive living to be far different from the one-sided cartoon parody Rosling portrays.

Furthermore, his low-income definition apparently only includes people living within or on the edges of industrial civilization. He fails to consider people who have lived completely independently of industrial society. In 1800, the majority of people lived in "extreme poverty," according to Rosling. But his definition of "poverty" apparently

⁶ Daniel Everett, *Don't Sleep There Are Snakes*, New York, NY: Random House, 2009, p. 278.

⁷ Colin Turnbull, *The Forest People*, New York, NY: Simon St Schuster, 1962 p. 26.

includes a lifeway that is simply not integrated into the global economic system. This would include all self-sufficient aspects of living, including low-tech agricultural/pastoral systems of bartering and hunting and gathering.

If you grow your own food locally, fetch water from a local spring, and hunt wild-game, if you live in any way low-tech no matter how satisfying and sustainable life is, then you are living in “hell” according to Rosling, and the technological system must “save” you. This is ridiculous of course, and it flies in the face of the intense satisfaction the freedom, dignity, personal fulfillment, and environmental balance that most of these cultures provide.

It gets worse. According to the author, by 2100 the world population will reach 11 billion, an increase of 3.4 billion people from our current population of 7.6 billion. To put that into perspective, this is more than the populations of India and China combined (currently 2.8 billion). How the author conceives of giving 11 billion people on earth the same material living standards as the most “developed” nations is quietly left ambiguous. Technology will have the answer he assures us somehow: “We must put our efforts into inventing new technologies that will enable 11 billion to live the life that we should expect all of them to strive for.” (p. 221). Here we’ve crossed over into the realm of fantasy. Rosling blithely glides over the fact that our current world situation—with just a fraction of 7.6 billion people living in fully “developed” or “level 4” categories—has caused *colossal* damage to the natural world, and now threatens catastrophic, unmitigated existential risks to life on the planet not just now, but *into the future, forever*. When people express to Rosling their fear in overpopulation, it’s obviously not the overcrowding, per se, that is their concern. What concerns them is the cost to the planet of the sum total of maintaining all of these new people at a certain material “standard.”

Assuming that Rosling and his peers were able to fit 11 billion on the earth, all living like middleclass Swedes, it would undoubtedly come at a tremendous cost. Everything has a cost, after all, and willfully blinding oneself from the costs doesn’t make them go away. The worldwide population would have to be ruthlessly regimented, regulated, and ordered so as to be “sustainable”, because 11 billion tech-enabled humans living *under* regulated lives would entail disaster. This would mean the complete end of anything resembling human freedom—far and away worse than what we already see in “developed” countries—and it would require omnipresent global control and management. Wilderness and wild country will have vanished to make way for the massive industrial and agricultural infrastructure needed to support the population. And this is to say nothing about the tremendous and absolutely appalling misery in “advanced” countries: the depression, anxiety, loneliness, suicide, stress, and frustration⁸ which have been consistently shown to grow in pace with economic and technological development? The situation here is truly abysmal. But of course to Rosling these are simply

⁸ The evidence is overwhelming. Here we only cite: Joseph, Soumya, “Depression, anxiety rising among US college students,” Reuters, Aug. 29, 2019, online at:

temporary “problems” which only more technology and development can “solve.”⁹ This is because Rosling and his circle will be there to “manage” everything, to “treat” everyone for the “benefit of humanity.” With such people shaping perception and attitudes, we are unfortunately barreling full speed ahead toward this nightmare vision every day.

All of the supposed improvements Rosling cites, and all of the graphs detailing upward trajectories, are simply reflections of the growth of the techno-industrial system. Each metric might reflect a positive trend in its own right, but it can’t be viewed in pure isolation. The world is comprised of interconnected forces—causes and effects. If you dig deeper into Mr. Rosling’s isolated “improvements” and take the entire system into account, you find much more disturbing trends. Take the decline in violence as an example: Of course Rosling, as a member of the technological elite, would laud non-violence as the most important moral code, Violence most threatens to disrupt the orderly, efficient functioning of the modern social machine he worships. For technology to progress smoothly, violence must be monopolized by the industrial system and individual-on-individual violence must be ruthlessly suppressed and replaced with a docile, meek population. To Rosling, the general trend toward less violence “is the most beautiful trend there is” (p. 114). “The world was once mostly barbaric and now it is mostly not” (p. 113).

First, the world only *seems* less barbaric on an individual level, but horrific violence is undertaken by organizations that, if not destroying each other in military confrontation (because their weapons are too powerful) are laying waste to the world in ruthless economic competition for survival. Second, non-violence is required among individuals who operate within and are dependent on these organizations, and individuals must sublimate their individual conflicts for the smooth functioning of their organizations becoming obedient cells in vast social organisms. All of this comes at a tremendous cost to individual freedom: maintaining this order requires the individual to suppress and internalize his natural hostilities and submit to regimens of education, propaganda, psychological coercion, highly-regulated and monitored living, all to a level far beyond what he has been psychologically and physically adapted to and therefore this loss of freedom results in great misery and suffering on part of the individual, to say nothing of the costs to human dignity. But this is all lost on Rosling because...

For the technocratic class, freedom is only conceived as being those meaningless and unimportant freedoms that have no practical effect. Real freedom for individuals would threaten the smooth orderly functioning of the technoindustrial system, because the system needs humans (for now) who must operate as orderly, docile, obedient gears in

⁹ The solutions proposed are either total insults to human dignity, or further expand the power of the industrial system at the expense of human freedom and autonomy (eg, Ref. to Theodore Kaczynski’s *Industrial Society and its Future* ^ 145). Amid a bevy of crises caused by prior and present technology, the faith that these progress-cheerleaders demonstrate is truly astounding; pushing readers to share their wild faith that the looming technologies to come will not heap upon us infinitely more problems, but only solve those as yet recognized and unresolved.

the social body. “The ultimate goal is to have the freedom to do what we want.” (p. 64) says Rosling. But what exactly is this “freedom” and what can and can’t we do exactly? “Thank you, industrialization, thank you steel mill, thank you power station, thank you chemical-processing industry, for giving us the time to read books.” (p. 220). In other words, fritter away your time in leisure and pleasure-seeking. For books,¹⁰ Rosling would sacrifice Nature and allow the currently known consequences of industrialization, steel manufacture, electric power generation and distribution, and industrial chemical production. Of course, humans need more than media and leisure to live full, rich, and joyful lives. People need to be in control of the practical life-and-death circumstances of their lives and the numerous psycho-social maladies of our era prove that there is no sanitized replacement for such real freedom and autonomy.

“A fact-based world-view is more comfortable. It creates less stress and hopelessness than the dramatic worldview, simply because the dramatic one is so negative and terrifying.” (p. 255). Having an errant interpretation of facts which suits your worldview accomplishes this as well. Diverging from your worldview is terrifying. And Rosling and his colleagues¹¹ are engaged in this self-delusion. It would be bad enough if these Rosling types were simply deluded buffoons, but unfortunately Rosling hints at something in his work that’s far more dangerous and insidious: If people don’t understand that the “facts” Rosling presents are good, it’s because of something wrong with their brains, he tells us. “Why do so many people’s brains systematically misinterpret the state of the world? ...illusions don’t happen in our eyes, they happen in our brains. They are systematic misinterpretations...most people are deluded...” (p. 14) One can imagine a future where the technological system will seek to “treat” people who draw the “wrong” interpretations of data meaning interpretations that are threatening or harmful to the system with various psychological or biological techniques. Having the wrong worldview (e.g., that a worsening state of Nature and human freedom is inextricably tied to technological advancement) becomes “delusional,” a pathological sickness to be cured. Rosling’s compatriots would of course deny that doing something like that would be justified (*currently*). But such an arrangement is logically consistent with the direction of industrial society, and not unprecedented. History shows that time and again powerful people will resort to such barbarity if they feel their power or their worldviews are being seriously tested. And they tend to act not with grudging regret, but with sincere righteousness.

¹⁰ The irony is that most people aren’t reading classical novels (or listening to Mozart), they’re drowning in crass electronic media which in many cases has become a perverse addiction.

¹¹ What we’ve said here about Rosling applies more-or-less equally to Steven Pinker, Matt Ridley, and Bill Gates.

Book Review The Nazi Seizure of Power By qpooqpoo February 10, 2020

The Nazi Seizure of Power: The Experience of a Single German Town, 1922-1945 by William Sheridan Allen, Brattleboro, Vermont: Echo Point Books, 2014.

No higher being will come to save us, No God, no Kaiser, nor Tribune.

If we want freedom from our misery, We'll get it only by ourselves.¹

Obviously, the Nazis are not to be admired for their silly ideology. To them, humans were merely cogs in the social machine. Their quest to mold society according to their vision through force—to pluck the weeds so as to make the perfect garden—was just a repeat of what aggressive civilizations have tried and failed to do from the dawn of history. It was doomed from the start, just as is every attempt to rationally plan and control the development of a society and implement a social vision. But the Nazis were astonishingly effective in their single, clear, and concrete short-term goal of attaining power in Germany, and their experience can offer some useful lessons to those committed to destroying the industrial system in order to save humanity and wild nature. This title is a good place to start. Its main takeaways can fall under four categories:

- (i) The Nazi's profit-driven organizational model;
- (ii) The Nazi's use of hierarchy and discipline;
- (iii) The internal culture of the Nazi party, including its composition; and,
- (iv) The cultural environment surrounding the Nazi party.

(i) The Nazi organization operated like a business, or more precisely, a pyramid scheme. Within the pyramid, the local group was the most basic unit, operating in towns and counties. The next step up, the regional offices ("Gau"), oversaw the local groups, who in turn were overseen by the Nazi national headquarters in Munich. The Gau would supply material and directive to the local group that the local group would pay for out of funds collected from membership dues and organized events and other fundraising. Cash in advance was the rule for everything that the local group received in return from the Gau—from printed propaganda to speaker's fees. While each member had to pay dues each month, it was the local group that was in charge of collecting them.

¹ German Socialist version of the *International*, reproduced as an epigraph to Chapter 6. (p. 69).

Roughly one third dues could be retained by the local group. The rest had to be turned over to the Gau, which then had to turn over half of what it received to the national Nazi headquarters. The requirement of making these fixed monthly remittances kept every level in the Nazi party “keenly interested in accurate membership records.”²

Nazis who missed three payments were automatically expelled from the party. New members also had to pay an initiation fee (which could be waived and would vary depending on income) as well as being assessed periodically for campaign contributions. There were also collections for a whole host of projects—elections, newspaper printings, fund-raising of various kinds exacted by regional and national leadership.³ Individual party members couldn’t personally profit from the party’s income. However, the expectation was that the competition for status and rank within the hierarchy would return the investment of individual members by granting them positions within the government, or else other satisfying or lucrative favors within the new system, once the Nazis came to power.⁴

The main source of income came from mass meetings; from the admissions and the collection taken up after the speaker’s performance. Therefore, the local group became very conscious of the quality of its meetings and its speakers—especially their entertainment value. The key to the whole system, “was the method of adapting mass meetings, with appropriate speakers, to local interests and concerns. Because what worked was immediately measurable in terms of attendance and contributions, effective themes and speakers were repeated while ineffective activities could be discarded.” (p. 82). There was thus constant feedback for what sorts of activities worked. This became a self-reinforcing system and allowed for a great degree of autonomy among the various group leaders: “Local groups were given almost complete freedom of action as long as they produced money, members, and votes.” (p. 82). The Nazis kept close track of whoever came to their meetings and afterward worked hard to get such people to join, contribute to, or at least vote for, the NSDAP [Nazi party]. (p. 78).

(ii) Much like a franchise corporation sets the rules and priorities of the franchisees, the Gau propaganda section formulated exact rules on how to run the meetings, “with a checklist for everything from the advertising to the use of the SA (Stormtroopers). There was even a model script with the actual words to be used at all points in the meeting plus blank spaces for the name of the town, the speaker, etc.” (p. 81).

“There were guidelines and pamphlets for door-to-door campaigning, slides and films, leaflets to pass out at meetings or stuff into mailboxes, posters for billboards...and gummed stickers to be pasted onto walls...advice on how to compose personal invita-

² Page 79.

³ “[M]embers of the Nazi party were exploited for all they could bear.” (p. 80).

⁴ “Although the local leaders did not personally get to keep the profits generated from meetings and other sources, profits meant that funds were then available to be applied locally for further recruiting activity, and the leader who was successful in building backing for Nazism could expect promotion within the Nazi hierarchy.” (p.81)

tions to ‘discussion evenings’ and even a breakdown of the expected costs for staging a mass march.” (p. 81).

The more the local group held profitable meetings and recruited members, the more propaganda materials and other resources it could obtain to buy new materials to recruit new members and supporters.

(iii) The Nazi movement was a middle-class movement. Most were middle-class and had business experience. They were not usually lower or working class. This translated into a remarkable working advantage over the Nazi’s political rivals, in particular the Social Democrats (SDP), whose roots were primarily working-class. The skill and energy of Nazis appeared mysterious at distance but became understandable once you looked at the local level.

The “NSDAP was the first mass movement of the middle class... [they] understood how to keep account ledgers... were familiar with fund-raising, inter-office memos, equipment leasing, etc.” (p. 143). As a result of this pre-existing orderliness, frugality, disciplined task-solving and industriousness, Nazi solutions were often “ingenious, flexible” (p. 78) while exhibiting “vigor and thoroughness” (p. 202).

By virtue of their superior organizational efficiency, the Nazis had the potential to outwork their opposition, and this was a potential they vigorously realized: it appears in the period from 1929-1932, that they simply were more hard-working, putting on more meetings, organizing more marches and more events, than the opposition.

(iv) (A) The Nazis could get away with more violence and intimidation:

In the 1920s and 1930s, the world was a far freer place, on an individual day-to-day basis, than it is today, simply by virtue of the relative technical primitiveness of the society of that time. This greater freedom was reflected by the higher degree of individual-on-individual violence and roughness. It would be reasonable to say that their society was thus more “dynamic” in the sense that, by virtue of this greater freedom, individual associations could crop up and evolve with a far greater degree of vigor and autonomy than they can today. In addition to this natural proclivity to more violence and roughness, the specific political turmoil of the period—especially from 1929-1932—led to such a high frequency of political violence that the political violence became normalized within the culture. Added to this, of course, was the fact that many of the Nazis were veterans of WWI and were already accustomed to a great deal of violence. They were also far more self-disciplined, tough, and conditioned to respect hierarchy than the average person today. Most of these cultural attributes were likely common to the great revolutionaries throughout history and its implications for a revolution by modern individuals against the industrial system need further exploration. It is obviously a far more difficult task for a modern revolutionary movement operating within an advanced industrial setting to establish the culture of fear and intimidation that surrounded the Nazis.

By 1932, political violence “was becoming a permanent institution.” “Between July 1 and July 20 there were 461 political riots in Prussia in which eighty-two people were killed and over four hundred seriously injured.” (p. 119).

Exchanges of taunts and insults became a daily occurrence. Scuffles and fights increased in frequency—and they could often be brutal.

Prison terms were extremely light; for assault with a deadly weapon, prison sentences ranged from two to six months. (p. 121). “[T]he courts were generally lenient...so that hotheads on both sides were encouraged.” (p. 146). This stands in stark contrast to advanced industrial societies today, where individual-on-individual violence must be ruthlessly suppressed for the sake of the orderly functioning of the industrial system.

(B) The Nazis provided what their society wanted:

Most people wanted radical answers, and they were tired of eternal political strife. They wanted hard, sharp, clear leadership: “When politics becomes a matter of vilification and innuendo, then eventually people feel repugnance for the whole process. It is the beginning of a yearning for a strong man who will rise above petty and partisan groups.” (p. 90).

The Nazis “presented the appearance of a unified, purposeful, and vigorous alternative.” (P. 86). The people also wanted complete answers. The Nazis provided a wholistic world view that stood completely apart from the contemporary society and promised a brighter future.

“The SPD emphasized the evils of Nazism but had no alternative program.” “It...could not promise a better future.” (p. 145).

People need to be impressed by pageantry and controversy. The Nazis provided this, both for their inherent propaganda value, but also to satisfy the yearnings of the population for entertainment and escapism during the dark economic times.

The Nazis “drew the tortured masses into the mammoth meetings where one could submerge oneself in the sense of participating in a dynamic and all-encompassing movement geared toward radical action in fulfillment of every need.” (p. 134).

(C) The Nazis established themselves as the most radical group:

The Nazis “had established themselves as both respectable and radical.” The Nazis “appeared vigorous, determined and, above all, ready to use radical means...” (P. 92) [emphasis added]. The Nazis had “stolen the banner of radicalism.” (p. 145) [emphasis added].

“The Nazis had to prove... that they were willing to use the power apparatus in a ruthless and effective way.” “The initial investment of terror would multiply itself through rumor and social reinforcement until opposition would be looked upon as wholly futile.” (p. 184).

The Nazis were consistently portrayed in local media as violent and vicious.

(D) The Nazis exploited pre-existing hatreds:

The Nazis exploited the pre-existing social hatred of the Socialists.⁵ In the same way, antitech revolutionaries can point out that contemporary leftists are simply agents of the technological system, attempting to force the system’s morality and conditioning down everyone’s throat so as to grow the system more efficiently. In doing so, anti-

⁵ Most of the middle class at the time were “bitterly opposed to the Socialists.” (p. 296).

teachers may be able to redirect strong pre-existing animosities and social currents against the technoindustrial system itself.

Maybe the Social Democrats of the Weimar era can be analogized to today's leftist mob— antifa, SJWs, BLM, you name it—and more broadly speaking, the perceived oppression of institutionalized political correctness. Popular opinion in Germany at the time was that the Social Democrats were simply not serious revolutionaries. [Maybe this perspective is paralleled by many people today who view leftist activists as simply engaged in a “play-act” (also: “Live Action Role Playing” or LARPing); collective non-rational outbursts of frustration that ironically enhance the status quo rather than undermine it.

Interestingly, anti-Semitism was largely absent in Northeim, the one town studied in this book, and was not promoted. Undoubtedly it was exploited throughout Germany in other locales, but the culture of Northeim did not lend itself to this. This stands as a good example for the adaptability and self-correcting nature of the Nazi propaganda system.

TWO DIVERGENT PATHS: Integral theory and current science[a]

By Tomislav Markus

Modern science¹ is characterized by a naturalistic and empirical approach. Hypotheses are tested by empirical facts. In science, "theory" means a coherent explanation of a certain problem or phenomenon, based on many important data, collected over time and "hypothesis" means merely "let's suppose" or, what is popularly known as speculation. There is no place for supernatural agents -god(s), angels or spirit(s)- in science, not because of dogmatic materialism but because there is -at least for now- no empirical verification of them. Scientific naturalism is methodological, not ontological since, due to the absence of facts, science has nothing to say about the possible existence of supernatural (or non-natural) agents; although, in fact, its existence is possible (Wilson 1998, Edis 2002, 2008, Bowler-Morus 2005, Perez 2008). Therefore, it has been - and still is - incompatible with the traditional axial religions in the West, above all with Christianity.

However, the naturalism and materialism of modern science were also a threat to modern secular ideologies. Liberalism and the various left-liberal heresies (Marxism, socialism, anarchism) inherited from the Axial religions the deep-seated belief in human exceptionalism, that is, the belief that human beings are not part of nature (but a special "social world" apart from nature) and not just animals (but something essentially different). Secular ideologies do not speak of supernatural agents or an immortal soul but of "historical progress", "humanity", "culture", "history", the "upward movement of evolution", etc. Human beings are special, not because they have an immortal soul, but because they have language, reason, history, etc.

In part, secular ideologies are mere secular versions of the metaphysics of axial religions or humanist ideologies adapted to the new circumstances of industrial society. However, true scientific naturalism does not recognize any gaps in the natural world, including human exceptionalism. The influence of the humanistic heritage of secular ideologies can be seen above all in the social sciences, but also in the natural sciences. For example, most Darwinian biologists are liberal humanists in their moral convictions.

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

This often implies the existence of strong tensions between the naturalistic approach to his science (evolutionary biology) and the humanistic approach to his personal moral and political convictions. Some Darwinists—Richard Dawkins would be only the most notorious case—demand that we “rise above” the chaotic “red tooth and claw” nature, just as any religious or secular humanist would.

This is a secular version of the Christian “vale of tears,” a dark view of the natural world typical of all Axial religions.² In the last 30 or 40 years, there has been a great acceptance of the naturalistic approach - Darwinian and ecological - in the social sciences (anthropology, archaeology, sociology, etc.), although the old humanistic and anti-naturalistic convictions are still very strong in them. The Integral Theory retains strong anti-naturalistic impulses because it often calls for “rising above” our “animality” and entering a “higher level of spiritual life.” This is essentially a modern version of the old anti-naturalism of the Axial religions, with which the Integral Theory has many important connections.

Physics, astronomy, or geology don’t matter much when it comes to human history or human behavior. Evolutionary biology, however, has been something very different since its inception. Charles Darwin (along with AR Wallace) was the first man to provide a concrete mechanism to explain how evolutionary processes worked. Later, in the modern synthesis between 1930 and 1950, the theory of natural selection was joined with Mendelian genetics. Neo-Darwinism implies that evolution is something that happens randomly and blindly, without following any direction or progress. There is only random adaptation to the changing circumstances of local environments. Although Darwin used some progressive terms[963] officially and sporadically, he was very clear - and we know this from his correspondence and private annotations - that his view of biological evolution was not progressive. However, this did not correspond to popular belief, which identified evolution and progress.

In the 19th century, “evolution”³ usually meant some kind of purposeful and progressive (upward) change towards “higher” forms of life (popular evolutionism[c]). It could implicate certain supernatural agents (God) but it could also be kept within the limits of life on Earth, since many secular thinkers substituted faith in God for faith in “historical progress.” As far as biological evolution is concerned, popular evolutionism meant an “ascent” from “primitive” species to “higher” species, with man (usually white European man at the time) at the top (anthropocentric vision). . As regards recent human history, “social evolution” meant a “progress” from “primitive” society to “advanced” civilization, with the industrial civilization of 19th century Europe at the top (“civilization-centric” view). and “industry-centric.”[d] The concept of “social evolution”

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

was largely abandoned in the social sciences during the first half of the 20th century, but progressive interpretations of recent history remained.⁴

In science, the term "evolution" primarily means biological evolution through (neo)Darwinian natural selection. For popular evolutionism, "evolution" has a much broader meaning, meaning any purposeful and "progressive" change, from the cosmic Big Bang to the social macrodynamics of recent human history. "Evolution" would be an almost neutral synonym for "progress" or "development", anything that someone interprets as a "progressive" or "ascending" change. Popular evolutionism is reminiscent of the 19th century myth of progress, which is still alive and well at the beginning of the 21st century, as the myth of "historical progress" is a fundamental metanarrative of industrial societies, which still dominates modern societies. social realities. Many contemporary thinkers, from proponents of the "Universe story"[e] (Swimme and Berry 1992, Berry 1999) to integrative theorists, subscribe to the notion, impossible to test scientifically, of "progressive evolution" in which human beings are the "emerging consciousness of an unfolding cosmos." However, in science, a term, such as "evolution" in Darwinian biology, cannot be arbitrarily transferred to other domains.⁵

The fragmentation of the various scientific disciplines as well as a certain sense of meaninglessness in scientific explanations have always produced dissatisfaction, often even hostility. A recent attempt to overcome this is the so-called "integral theory".⁶ The concept of evolution is crucial for the Integral Theory and for it it means mainly popular evolutionism (evolution understood as progress or upward movement), not scientific Darwinian evolution. Popular evolutionism is - both today and in the 19th century - at best a form of speculative philosophy without any scientific basis. At least so far, the Integral Theory has no substantial connection with the natural sciences and, especially importantly, with evolutionary biology. Many critics have recently raised concerns about Wilber's interpretation of neo-Darwinism and Darwinian evolution in general (Kazlev 2004, Lane 2006, Visser 2008a, 2008b, 2009a) and I could mention here many of Wilber's less serious errors (like, for example, Darwin was Spencer's friend and that he applied Spencer's evolutionary law to biology, -Wilber 2001-), but it is not necessary.

The Integral Theory has no real connection with the natural sciences, yet perhaps this is not a crucial flaw. Most people, both inside and outside academia, can easily accept, under pressure, that biological evolution is not progressive, but what about human history? The Integral Theory basically has an anthropological approach, be-

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

cause it is mainly interested in human beings, their societies, both past and future. So perhaps an anthropological context is more relevant to her? How does the social sciences affect you, especially the historical ones?

The Integral Theory would start from some interpretations of recent human history, of the last 10,000 years or so (the so-called "social/cultural evolution"), and would have a fundamental connection with anthropology, archaeology, historical sociology, historiography and similar scientific disciplines. This is a matter largely overlooked in current discussions of Integral Theory. There is a big methodological problem here. If you want to build an Integral Theory, there must be a significant consensus around some scientific area, as is the case, for example, with the neo-Darwinian approach in evolutionary biology or, more broadly, with the naturalistic methodology in the natural sciences. However, in the current social sciences there is no consensus, neither about the methodology nor about the interpretation.

Many-probably the majority-social scientists prefer a materialist approach, emphasizing that material factors are central to human history: population, technology, politics, the state, climate, genetics, erosion of the soils, the war, etc. and this would contradict the basically idealistic approach of the Integral Theory. Certainly in many social scientists there is some degree of mixing of materialistic and idealistic approaches, especially with regard to human peculiarity. There is a strong belief in exceptionalism

[e] "Universe story" in the original. *N. of the human t.*, in the irrelevance of biological factors and in the autonomy of "cultural evolution". Even today, many social scientists completely ignore biological and ecological factors and defend traditional humanistic explanations: only social factors matter. However, many others argue that biological and/or ecological factors are important explanatory factors.

In the field of valid interpretations of recent human history, there is even less consensus. Many social scientists still take the traditional progressive perspective: human history may not be "progressive" in a moral sense, but it certainly is in a technological and social sense. However, many scientists have abandoned, in part or completely, the progressive interpretation. Today, and for 30 or 40 years, there have been fierce debates about "social progress", "social evolution" (is there such a thing?), the ancient or recent roots of war⁷ and social hierarchy, the ecological balance of different types of societies, etc.

How can an Integral Theory be constructed if there is no consensus about any of the important points? In practice, some integral theorists may adopt some views that fit their own positions, since lack of consensus does not mean that anything goes. This is the deepest connection that exists between the Integral Theory and science. Unfortunately, the weight of the evidence does not support the dominant interpretation in the Integral Theory, which interpretation is methodologically

⁷ For example: "We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible." (*The Earth runs out*, pages 246-247).

idealistic and progressive. In the social sciences the materialist approach is by far the dominant one and anti-progressive interpretations are numerous and well documented. In [<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-iluminacin-espiritual>][^f“The limits of illumination”][<http://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del-sistema-tecnoindustrial/los-lmites-de-la-illuminacin-espiritual>][^g“spiritual”] I explained why I think recent human history is not progressive, but regressive, not in a moral sense, but in regard to the quality of human life (Markus 2009).

Some integral theorists may accept a progressive interpretation, just as many scientists still do, but they have to be aware of the existence of opinions and detailed criticisms completely contrary to the concept of “historical progress” and “progressive social evolution”. The naive faith in “historical progress” has not completely disappeared - as has the notion of “progress” in evolutionary biology - but it has long since lost scientific credibility. In general, as I pointed out in my previous article (Markus 2009), knowledge about the social sciences is very superficial and limited both in Wilber and in most other integral theorists. This is a big problem for a theory that pretends to be historical and talk about “social evolution”.

Wilber and some other integrative theorists (McIntosh 2007) do not even recognize the various fundamental forms of human social organization, such as simple and complex hunter-gatherer societies, simple and complex horticultural societies, pastoral societies, agricultural civilizations, and agricultural societies. industrial. Instead, they often use vague and imprecise terms without any scientific validity, such as “tribal”, “warrior”, “mystical” consciousness, etc. (McIntosh 2007). It is true that Wilber (2000) admitted that industrial society has many more problems than, for example, hunter-gatherer societies, but he thinks that this is due to a “greater average cultural depth”. However, what does this mean, if not a higher standard of living or more techno-junk[f] without any relevance to the quality of human life? The imprecise chatter about the “price of

[f] “Techno-gadgetries” in the original. *N. of t.* progress”, “stages of development” or a “higher consciousness” has always been false, but it is especially unconvincing in light of the great social and ecological disasters of the last hundred years.[8]

In “The limits of spiritual enlightenment” (Markus 2009) I mentioned the theory of “biosocial discontinuity” that explains anthropic problems as consequences of abandoning our evolutionary and social context, the hunter-gatherer life. Whether correct or not, this is a truly scientific theory that can be tested, corroborated, or disproved by solid historical facts. Wilber and other pro-Wilberian theorists do not even mention such a theory. For the Integral Theory, whose approach is idealistic, the roots of anthropic problems consist of a certain lack of moral/spiritual wisdom or insufficient enlightenment[g]. This is a modern version of the quasi-argumentation of the philosophers and theologians of agricultural civilizations with their emphasis on the existence of some kind of intrinsic moral flaw in the human mind.

If history is progressive - that is, a "progressive evolution" of consciousness or something similar - why aren't there anthropic problems - apart from the usual misfortunes - in hunter-gatherer societies? Are these problems the "price of progress"? But what does progress mean if it causes more and more human misery and a gradual decline in the quality of life for human beings? Anthropic problems -main characteristics of all civilizations, and which have culminated in the last hundred years- constitute the biggest problem of all progressive interpretations of human history. The big cities of industrial societies are the most unnatural[h] environment in human history. An environment in which basic human needs cannot be met, and which continually provokes pathological and destructive behavior.⁸ What does "progress" mean there if not irrational and destructive consumption, including the consumption of "spirituality"[964]? It is strange to believe that "the most primitive level of consciousness" occurs in (hunter-gatherer) societies that had/have no anthropic problems at all and even stranger that "the highest level of consciousness" occurs in a society in which absolutely dominates the most absurd and destructive lifestyle ever known and in which anthropic problems abound.

If the theory of biosocial discontinuity is basically correct, there is no such thing as "modernity." The industrial societies of the last 150-200 years are just a continuation - with some significant changes - of the fundamental processes of the last millennia: demographic and technological expansion, urbanization, state power, militarism, ecological destruction, etc. The "noble aspects" of "modernity" - often emphasized by Michael Zimmerman (1994, 1998, 2000, 2003a) - are only a limited reduction of some of the anthropic problems (such as contagious diseases or gross inequalities). social) typical of agricultural civilizations, but accompanied by an increase in many other problems. The fundamental comparison should not be made between agricultural civilizations and industrial societies -because they are all products of the same social macrodynamics that are at the root of anthropic problems- but between civilization and the (simple) hunter-gatherer society, which it constitutes our evolutionary context; a way of life that covers 99.99% of human history and that genetically we have never abandoned.

Industrial societies of the 20th century and today may be "democratic" (perhaps) when compared to agricultural civilizations, but they certainly are not when compared to (simple) hunter-gatherer societies. In every civilization, manipulative and powerful

⁸ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

elites govern who can appeal to the will of God or the People. For me, as a historian, if the account of recent human history offered by the (Wilberian) Integral Theory program taken as a whole is wrong, this is its failure, at least in a scientific sense. An erroneous explanation of human history is fatal for an Integral Theory that presents itself as a mainly anthropological approach (interested in the human). Not to mention its relationship with evolutionary biology and other natural sciences.

The Integral Theory is basically an idealistic position since it talks about the "spirit", "consciousness", "values", "worldviews", etc. as if they were fundamental factors in human history and even beyond.[966] So, there is a tendency for anthropic problems to blame certain intellectual factors, especially modern science with its fragmentation, reductionism and materialism ("flatland"[j]), atomism, etc. This is often the case not just with pro-Wilberian integral theorists (Holick 2006, McIntosh 2007) but with many other people, especially radical environmental critics (Capra 1984, Shelldrake 1994, Marshall 1994, Goldsmith 1998).[967] Here the Integral Theory is not far removed from religious conservatives and their ideological attacks on science. However, the error is the same, that when in leftist circles "capitalism" is blamed or when in radical environmental circles "industrialism" is blamed. The fundamental problems of modern civilization - wars, pollution, resource depletion, urban crime and anomie, destruction of habitats and wild species, interpersonal exploitation, etc. - already existed in agricultural civilizations, more or less in the same form.

However, there was no modern science - neither capitalism nor industrialism - in these societies. The same phenomenon must have the same cause(s). Biosocial discontinuity theory can provide a simple, logical, and science-based explanation. However, it is irreconcilable with any idealistic or progressive approach. Another reason why modern science cannot be blamed for the sense of absurdity and meaninglessness is scientific illiteracy - the indifference or even hostility towards science (as is the case with creationism in the US) - which it exists in the vast majority of the industrial-urban population. The average adult male in industrial society has no real connection to science or science education in his life, but suffers from a strong sense of meaninglessness. Perhaps it is because he lives in an unnatural urban-industrial society, an environment completely foreign to the human animal, but it is certainly not because modern science is "naturalistic", "mechanistic", "atomistic", "reductionist" or whatever. . Accusations against science are often based on identifying science with (or, ironically, reducing it to) physics (the fallacy of physicalism), a common mistake in the Wilber theory. Actually, nothing normative can be deduced from physics - not from chemistry, not from astronomy, only a picture of the world without moral sense. However, evolutionary biology, with its genetic adaptation 12

optimal within the natural world, it is different.[968]

Wilber's own ignorance of philosophy is well known in academic circles (Visser 2008a, 2008b) and there is only one Department of Integral Studies at one university (JFK) that I know of. This is too small a thing to call "the academic emergence of integral theory" (Forman and Esbjorn-Hargens 2008). Perhaps things will change

in the near future because there is a lot of intellectual activity at the Integral Institute, with many young scholars and a well-edited Journal of Integral Theory and Practice. The worsening of the megacrisis and the collapse of industrial societies (I will talk about it in my next article, [<http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral>][“El”[<http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral>][ocaso del mundo integral”]) may reinforce idealistic convictions and faith in a “correct worldview” as a “solution”. However, in its Wilberian form, Integral Theory cannot offer anything substantial to science and can only constitute a kind of speculative philosophy or one more version of New Age spirituality.

To date, integral theorists have been completely ignoring biosocial discontinuity theory, not even mentioning it to criticize it: they seem to simply be unaware of its existence. Among Wilber’s like-minded authors, there is only one scholarly scholar—Professor Michael Zimmerman of the University of Colorado, Boulder—who possesses a high-level academic résumé, with several serious books and many peer-reviewed articles. However, Zimmerman’s ecological philosophy is not essentially “Wilberian”, since he only accepts some of Wilber’s general interpretations, such as the progressive perspective of recent human history (“progressive social evolution”) as well as the imprecise chatter about the “spirit” and “spiritual development” (Zimmerman 1994, 1998, 2000, 2001, 2003a, 2003b).

Basically, Zimmerman’s ecological philosophy, after its Heideggerian and deep ecological phases, is, with some critical nuances, a version of the modernist, progressive, and humanist liberal approach, based on the acceptance of today’s liberal democracy.[969]

Basically, the Integral Theory is a modern version of the so-called perennial tradition or perennial philosophy[k] (mainly Hegelianism) adapted to the circumstances of late industrial society, mainly popular evolutionism, “enlightened” neoliberal globalization and “desperate search”. of Novoerana spirituality.[970] Wilber’s disciples and colleagues often present the Master theory as a scientifically well-informed and grounded position (Howard 2005, Reynolds 2006, McIntosh 2007, Esbjorn-Hargens and Zimmerman 2009), but this is difficult to accept. The scientific credentials of the Integral Theory are very bad and do not ratify its claims to be “including” and “transcending” science.

The Integral Theory can legitimately defend a philosophical (non-scientific) approach, but certainly not “inclusion” or “transcendence” with respect to science. However, this is not the worst news. Perhaps the Integral Theory may have a purely moral or spiritual importance for urban middle-class people, a form of temporary escape from absurd and stressful daily life less destructive than drugs, alcohol or fast cars, and more “enlightened” than TV or the Internet. Perhaps the Integral Theory can fill the great void in human minds (in some) and offer some kind of consolation or “search for meaning” (although, then, it would not be a theory at all, but some kind of spiritual therapy with purely practical purposes). However, in the next article, “The twilight of the integral world”, we will see that this will not work well either.

GRADES

1. "Science" here means and a theoretical body of hypotheses, theories and knowledge about the natural world, including human societies. Science is different from technology; the purpose of the latter is manipulation and control. As a continental European, I include among the sciences also the social disciplines (anthropology, archaeology, sociology, etc.), not only the natural disciplines (physics, biology, astronomy, etc.). The world is one and human beings and societies are part of nature. So there is no dualism between the natural world and the social world. The human social world is a part of the natural world, just as the social world of ants or wolves (for convenience I am using here the expressions "natural sciences" and "social sciences" although the latter are actually are human sciences, their object of study is the human condition). In a first sense, the Integral Theory is much more of a philosophy - or an intellectual version of New Age spirituality - since it is much more speculative and presents a quasi-integral approach that is not based on the natural or social sciences. It often involves a highly selective approach: taking this or that and ignoring what one dislikes. However, "theory" can also mean a kind of intellectual position or abstract interpretation. It is in this second sense that I use the expression "integral theory" here. Although the term "integral" is misleading (different authors use the term in very different contexts and with very different meanings depending on their convenience), I keep it here because it is used by supporters of that theory. A more appropriate term, for much of this kind of thinking, would be "Wilberian theory" or "Wilberism" (somewhat similar to how the term "Marxism" is used, and much more appropriate than this since the Master is still here, alive). and kicking), often even "orthodox Wilberism". By his own words, Wilber has stopped responding to critics and is dedicated to working exclusively with individuals who understand the integrative (ie Wilberist) approach (Ken Wilber Online: wilber.shambhala.com⁹). This is exactly the way Marxists talk: you cannot criticize Marx, because if you do, you have not understood him. Only certain internal criticisms are permissible (perhaps). Certainly this is no way to "include" the objective scientific approach. No wonder many people accuse Wilber of dogmatism.

2. This fact also confirms that the naturalism of science is not a product of dogmatic faith - as religious conservatives, but also Wilber and many of today's integral theorists constantly argue - since all fanatics firmly believe that their dogmas - God, the liberal free market, the communist utopia or whatever - they are something more valuable than everything else. Many scientists do not like naturalism or materialism on a personal level, although they practice it in their sciences, since morally they remain humanists (liberals, Marxists, Christians, etc.). Many scientists happily accept faith in historical progress, but know that "progress" has been completely banished from the natural sciences and partially from the social sciences as well.

⁹ Page currently non-existent (2020). *T.N.*

3. From the 1860s to the 1920s, the term "Darwinism" often referred to popular evolutionism, not Darwin's theory of natural selection. Later, after the modern synthesis, "Darwinism" came to mean neo-Darwinism, a combination of the theory of natural selection and Mendelian genetics, with no reference to "progress." See: Ruse 2000, 2006, 2009 and Bowler 2003.

4. For the fate of the term "social evolution" in the social sciences, see: Harris 2001, Pluciennik 2005, and Sanderson 2007. Current social evolutionists, such as the sociologist Stephen Sanderson, are far from naïve progressives (something that however, it is typical of integral theorists), and they base their theory on neo-Darwinism; that is, his social evolutionism is only an effect of the incursion of neo-Darwinism in the social sciences. This is anathema to Wilber and other mainstream theorists, as they advocate a slightly updated form of traditional 19th century social evolutionism (especially the anachronistic analogy between social and personal "stages of development"), or the incorporation of traditional social evolutionism in the dynamic Great Nest of Being. For me, there is no such thing as "social/cultural evolution", only social macrodynamics or rapid social change – from the perspective of slow Darwinian evolution – from neolithic domestication to today's global industrial civilization.

5. The popularity of popular evolutionism is one of the main symptoms of the little importance of science, as a theoretical body of knowledge, outside of narrow academic circles. The vast majority of the population of the so-called "advanced societies" and "scientific cultures" in Europe, North America and Australia is more or less scientifically illiterate. The popular (and false) perception about the great importance of science is mainly caused by its confusion with technology. Many attacks on science, especially in radical postmodern and environmental circles, are based on this confusion. Wilber and other integrative theorists are constantly making the mistake of overestimating the importance of science. For example, Wilber argues that scientific materialism is the "official" worldview of the modern West (Wilber 2000:224) and other integrative theorists agree with him (Zimmerman 1994, 1998, 2001, Reynolds 2006, McIntosh 2007, Esbjorn-Hargens and Zimmerman 2009). In reality, the official worldview is the neoliberal ideology with its blind faith in "historical progress", in consumption as a synonym of well-being, in the free market (and in the state, in crisis, as it is today) and in Technological "miracles". This has nothing to do with science, in which anti-progressive convictions are widely accepted. In one of his earlier works, Michael Zimmerman warned that in natural science a progressive interpretation of change, especially one like the Wilberian one, is very rare and problematic (Zimmerman 1998), but in later works he reaches different conclusions.

6. Here, Integral Theory basically means the transpersonal philosophy of Ken Wilber and the vast literature related to it, although there is at least one other important contemporary thinker - the Hungarian Ervin Laszlo - who also advocates an "integral theory". Some of its views—such as historical determinism or levels of reality (a favorite theme of perennial traditions) or supernatural agents—are not crucial to Integral Theory; however, the idealist approach (the primacy of ideas/worldviews/consciousness,

although not the denial of the objective existence of the external world) and progressive (change, especially historical change, is "progress") is crucial. For Wilber's TCTN (all quadrants, all levels)[m] model, the ideas of an "upward evolutionary movement" and "progressive development", especially in human "social evolution", are certainly fundamental in all its "phases".

7. The question of war is a good example of the difference of opinion. In the last 10 years or so, there has been a veritable explosion of studies in the academic literature on the "origins of war" -the term has very different definitions according to different authors- (Keeley 1996, Kelly 2000, LeBlanc 2004). , Fry 2006, 2007, Arkush-Allen 2006, Ferguson 2006, Gat 2008). Some theorists (especially many Darwinists) defend an ancient origin of warfare and some (many cultural anthropologists and archaeologists) defend a recent origin (after Neolithic domestication). It is not surprising that integral theorists defend an ancient origin of war (Wilber 2000), which has to be "overcome" through the achievement of "higher levels of consciousness". In my opinion, some anthropologists and archaeologists - Douglas Fry, Jonathan Haas and Brian Ferguson in particular - have convincingly shown that the second interpretation, especially when applied to simple hunter-gatherers, is the correct one. This is also logically consistent, since if war is an ancient phenomenon there would be some genetic causes of war and genetic adaptations to it. However, human beings -unlike some species of ants- were and continue to be very poorly adapted for war, to which many data bear witness: forced recruitment, intense military training, warmongering ideologies, demonization of the enemy, promise of rewards in this and the next world, use of narcotics, combat and post-combat stresses, etc. Wilber (2000) claims that hunter-gatherers "invented" war and slavery, but this was only so (perhaps we don't know for sure) in complex and sedentary hunter-gatherer societies, which are a rare and recent anomaly in human history. The crucial point is to determine when war and hierarchy became a regular/frequent phenomenon and a means of resolving conflicts between and within human communities; and the evidence gives a clear answer: after Neolithic domestication. Some integrative thinkers cite academic literature to imply that there is a consensus on this topic, for example, ecological destruction in so-called "tribal" or "indigenous" societies (Esbjorn-Hargens and Zimmerman 2009), but no such consensus exists. and terms as vague as these are scientifically useless.

8. In a future article, "The Decline of the Whole World," I will discuss Wilber's historical and social views in detail, especially about recent human history and industrial society.

9. Wilber (2000) has argued that the materialist approach - which admits that the natural world is the only reality - is part of "industrial ontology". However, biosocial discontinuity theory shows that this is not the case. The essence of "industrial ontology" - in liberalism, communism and fascism - is not naturalism or scientific materialism at all, but faith in "historical progress" and in the conquest of (wild) nature by technological and demographic expansion. It is very strange to have to consider that Paul [m] "AQAL (all quadrants, all levels)" in the original. *N. from t.*

o Here Markus makes a “slight” mistake. It literally says: “polar bears should live in the North and South Pole”, that is, “polar bears should live in the North and South Poles”, but the natural distribution of polar bears is limited exclusively to the highest latitudes of the Northern Hemisphere and therefore does not include Antarctica at all. Pretending that polar bears lived in the South Pole would be completely unnatural, which is precisely the opposite of what the author intends to argue in this note. In fact, Antarctica is called that precisely because there are no bears there: “Arctic” refers to “arctos”, bear in Greek, that is, it is the area where bears live; “Antarctica” would therefore mean “zone where there are no bears”. Thus, the error has been corrected in the translation by removing the reference to the South Pole. *N. t.* our ancestors were living for millions of years. This is true in principle, regardless of whether or not it is possible to do so in practice. The typical accusations about the “noble savage” are irrelevant here, since - it must be repeated constantly - the theory of biosocial discontinuity has nothing to do with morality, only with genetic adaptation (see: “The limits of enlightenment spiritual” -Markus 2009-). Contemporary Darwinists rarely mention this, not even those who talk about the adaptive gap, due to their personal political and moral convictions (for liberals and other humanists, civilization must always involve some kind of “achievement” and “elevation” the brutal and chaotic natural world). It is true that Darwin and many Darwinists did and still do overemphasize competition, but this is a residue of the Malthusian hypothesis (continuous population increase in a finite world), which was abandoned in evolutionary biology long ago. Darwin’s theory of natural selection can exist without the Malthusian hypothesis and thus without the primacy of competition and without a dim view of the natural world. In nature, both cooperation/symbiosis and competition occupy a more or less equally important place. Without the Malthusian hypothesis, the natural world does not become a paradise, but neither is it a hell or a bloody battlefield against which the human being has to “rise”.

13. I have written a detailed critical review ([<http://www.naturalezaindomita.com/resenas/las-trampas-de-la-ecologia-wilberiana>][“Las trampas de la ecología wilberiana”]) of the professor’s new book Zimmerman (partly authored with Esbjörn-Hargens) *Integral Ecology* (Esbjörn-Hargens and Zimmerman 2009) which has many good points and a high academic level but suffers from all the flaws of the Wilberian approach. His book is an interesting case, not of integral ecology, but Wilberian.

14. I agree with Frank Visser, who has argued, in a recent article, “Perennialism Lite”, that Wilber’s theory, even in its post-metaphysical phase, is much closer to the perennial tradition than to modern science (Visser 2009b). By emphasizing “Spirit” (i.e., evolution as “Spirit in Action”), his theory remains firmly anchored in axial metaphysics despite Wilber’s claims of an “integral post-metaphysics” in his Phase 5 Wilber has often criticized New Age, but there are many commonalities between his theory and New Age spirituality, most notably in his critique of “modern materialism” and the typical postmodern search for “meaning/spirituality.” At least from the perspective of science, the Integral Theory has to be seen as one more aspect of the spirituality

of the New Age. The main objections to Wilber's Integral Theory can also be applied to Laszlo's theory of the "akashic field" (a fundamental energy field that carries information), since it is also not based on neo-Darwinian biology or the social sciences (Laszlo 2007, 2008).

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¹⁰ There is a Spanish translation: *Science and the Akashic field: an integral theory of everything*, Ediciones Nowtilus, Madrid, 2004. *N. from t.*

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Civilized to death. The price of progress

(Book by Christopher Ryan)[1,2]

This book is intellectually dishonest. For this reason, I am only going to deal in this review with a few issues that are mentioned or developed in it. Let's see if I can avoid Brandolini's law or the asymmetry principle of nonsense, the one that says that the amount of energy needed to refute nonsense is an order of magnitude greater than to say it. *Civilized to death* is full of nonsense, lies, misunderstandings, fallacies, biases and maybe some scattered truths. However, exposing them all would require writing a multi-volume book, and I am not exaggerating. The problem is that Ryan's argument rests on scientific reports, reference works (supposedly) from some field of knowledge of the social sciences or opinion studies. Ryan develops his speech by commenting on and citing selected texts and books from here and there, which opens up a considerable range of topics. However, his way of proceeding repeatedly falls into the fallacy of authority and the fallacy of incomplete evidence.

Fallacy of authority

The fallacy of authority consists in maintaining that something is true because an authority, in this case, an academic authority, says so. The truth of an argument or a fact is not sustained because they are defended by this or that person but because of their consistency with reality, with the evidence. It may be that a wise person masters a subject that he has been studying for years and years and what that person says is more reliable, but it can also be that a person spends the same years studying a subject and does not hit the ball on that subject. Or it can be, more frequently, some intermediate case between the previous two, even the best scribe throws a blur. The certainty of an affirmation is not given by the person who expresses it, that must always be kept in mind. Christopher Ryan repeatedly presents us to this or that academic expert as an expert on the subject and tries to make us believe that what said expert says is highly proven and forms an inseparable part of the body of knowledge on that subject. If we're not on our guard, it sneaks up on us. This brings us to the other fallacy.

Fallacy of incomplete proof

This fallacy consists of arbitrarily selecting the cases or the arguments that defend a position or the evidence that supports a conclusion. In English, this is called "cherry picking", selecting cherries. If I select, negligently or intentionally, the evidence or facts that support the conclusion I agree with already in advance, I am not finding the truth. On the contrary, I am deceiving myself or deceiving others. In order to understand a topic and achieve true knowledge about it, it is necessary to be able to assess *all* the relevant evidence, not just those chosen for a spurious interest. What Ryan does in *Civilized to Death* is present as certain interpretations of academic experts who are in tune with his own thinking. It exposes these purposely selected interpretations as if they were the whole truth on the subject, when, at best, they are only a very small part of the academic debate, and, remember, they may not be reliable information.

Let's look at some examples of all this.

In the book's introduction, "Knowing one's own species", Ryan mentions the story of a Fuegian native, whom the English, who thought they bought in exchange for a mother-of-pearl button, called *Jemmy Button*. [174] In the story of this indigenous, we can find almost all the elements that refute the idealizations about hunter-gatherers that are exposed throughout Ryan's book. Or rather, rather than refute, what this example clearly shows us is how Ryan arbitrarily selects the part of the story that suits him and leaves out the inconvenient parts. What are these idealizations about hunter-gatherers? Ryan starts from what he calls "quasi-universalities" of hunter-gatherer life: egalitarianism, mobility, and gratitude. These three characteristics will gradually attach certain values, which will sound strangely familiar to us. With "egalitarianism" he uses a catch-all term from anthropology that can include the absence of a clear hierarchy in social organization, informal leadership restricted to certain tasks and built mainly through persuasion and not coercion, the desire for autonomy individual, reciprocity in treatment and in the exchange of goods, equality between the sexes, equality of opportunities and access to resources, redistribution of wealth, etc. In this disastrous drawer, many anthropologists (it is not just Ryan's problem) have been constructing a concept-trap to assimilate some characteristics of hunter-gatherer societies to the political values that they themselves defend, mainly equality, pacifism and hedonism. This politicization of the study of human societies has been going on for decades and is part of a more general phenomenon whereby social science studies have been taken over by left-wing "researchers". It's not just about bias or loss of objectivity, it's about misleading and mischaracterizing hunter-gatherer societies for political reasons. Ryan, by choosing certain anthropological sources for political sympathy or whatever, falls into this trap (or wants to set it for us readers).

With "mobility", he refers to the possibility of joining neighboring camps, the dynamic reconfiguration of nomadic social groups that occurs according to the seasons and the availability of resources, social life or internal tensions. By "gratitude", Ryan refers to the supposed self-perception of hunter-gatherers "as the lucky beneficiaries of a generous environment and a benevolent spiritual world" (p. 38) since they would not see themselves as the inhabitants of a hostile world. , dangerous and resentful (accord-

ing to Ryan, among hunter-gatherers there would be no beliefs about spirits punishing them or taking revenge on them for some behavior).

Well, how does the story of Jemmy Button, as a member of one of those nomadic hunter-gatherer societies, fit into this description? It doesn't even fit. In fact, as soon as one pays attention to their history, one will see some of the real characteristics of the nomadic hunter-gatherer peoples. Jemmy Button's original name was Orundellico and he belonged to the Yagán or Yámana people, one of the hunter-gatherer societies that inhabited Tierra del Fuego, in the extreme south of the American continent.¹ The source Ryan uses to tell his story² offers much more detail than he gives us. Ryan, at the beginning of his book, mentions some cases of indigenous people who rejected the civilized way of life as implying that the life of indigenous societies had attractions that civilization lacked (lacks). According to him, Robert FitzRoy, captain of the *Beagle*, had captured three Fuegians,³ two children and a young man (Fuegia Basket, Jemmy Button and York Minster, respectively; the names are they put the English), whom he would take to England to "benefit" them by learning about civilized life and customs and the English language. They even got to know the kings of England at the time and after a little over a year they were sent back to their land, again on the *Beagle*, this time accompanied by Charles Darwin among crew. These events occurred between 1830 and 1833. The English searched in Tierra del Fuego for a suitable area to build cabins and plots to grow some plants. However, a year after leaving the Fuegians there, the English returned to the area, finding the cabins and the abandoned crops. They found Jemmy, who confirmed that they had stopped following civilized customs. Ryan rescues what Darwin left written about that reunion and how painful it was to see Jemmy's new appearance, considered a friend by several of the English sailors. "When Captain FitzRoy offered him a passage back to England, Jemmy refused on the grounds that he 'had not the least desire to return to England', since he lived happily and contentedly surrounded by 'so many fruits', 'so many fish' and 'so many fishes'. birds'" (p. 15). This is how Ryan implies a new rejection of civilization by an indigenous person, a rejection based on the happiness that provided him with an environment abundant in food and that would allow him to fall into idleness (another of the idealizations of Ryan and other authors about life of nomadic foragers). However, if we go to the source used, the Hazlewood book, we will see that there is much more to Jemmy's story. Ryan has nibbled on what has interested him, leaving many relevant facts along the

¹ In addition to the Yámanas, the other societies known to have inhabited the Tierra del Fuego archipelago in recent centuries were the Onas or Selk'nam, the Alacalufes or Kawesqar, and the Haush or Mánekenks. All these societies are called Tierra del Fuego, in turn, because they inhabited Tierra del Fuego, which in turn seems to have received this name because the first Europeans who contemplated these lands, the Magellan expedition, were surprised by the number of fires of indigenous camp in the area.

² This is Nick Hazlewood's book, *Savage. Life and Times of Jemmy Button*, Edhasa, 2004.

³ Actually, Hazlewood states that there were four natives transported by the English. Ryan does not mention the fourth, named Boat Memory who died of smallpox shortly after arriving in England.

way. To begin with, if Jemmy's testimony about the reasons for his refusal to return to civilization is accepted, his testimony and that of the other Fuegians on the trip about the practice of cannibalism as a last resort in times of scarcity should also be accepted. about food, about violent disputes with enemy groups, about the territorial border demarcations that should not be entered, about the spirits that sent "punishments" for bad behavior, about the ostracism of problematic individuals, etc. That is to say, the Fuegian societies were not peaceful, the environment did not always easily provide them with the necessary resources to survive, nor were the relations between them always harmonious, egalitarian and bearable.

Ryan, carelessly in my opinion, not only overlooks such testimony in his reading of Hazlewood's book, but also omits other anthropological sources on the Fuegians that might well have opened his eyes to his idealizations. Jemmy Button's comments about the wickedness of his enemies and their misdeeds could well have been contrasted. Their enemies were the Onas, inhabitants of the Big Island of Tierra del Fuego. They were also nomadic hunter-gatherers like the Yagans, although they were not originally canoeists.⁴ Like many other known hunter-gatherer societies, they were territorial and their social organization was marked by the internal division of their territory into areas they called *haruwenh*. Each one of these areas was assigned to a family lineage, which sought in it what it needed to dress, feed and subsist. In this case, "mobility" was not as easy as Ryan leads us to believe it is among this class of nomads. But the most interesting thing about the Onas' ideology and mythology is that they were clearly patriarchal and expressly assumed inequality between the sexes. In their mythology, men had secretly conspired to overthrow the matriarchy that had existed in the remote past and seized power. They periodically held a ceremony, called *hain*, in which those mythological events were recreated and in which young men were welcomed into adulthood through a series of tests.

You have to think carefully about Ryan's work. He wants to present us with an attractive society even for people who have known the most powerful civilization of the moment (the British) -and it is attractive, according to him, because it is egalitarian, peaceful and in an environment where abundance reigns- at the same time that it passes through High that, right on the island next door, on the Big Island, there is a society that does not fit their "descriptions" at all. Ryan is a new-fangled missionary, not like those who tried and still try to spread Christian nonsense to the minds of savages. It is one that tries, in the absence of "savage" minds, to reach the minds of those dissatisfied with civilized life and to do so brings egalitarian, pacifist and good-natured nonsense.⁵

⁴ Fuegian societies differed in their main way of moving. The Onas and the Haush moved mainly on foot, while the Yaganes and the Alacalufes made canoes to move between the different islands on which they lived. Jemmy Button related to the English an occasion when the Onas moved with stolen canoes to make an unfriendly incursion into Yagan territory.

⁵ The reader may think that I am exaggerating in this review and the discrepancy lies in the ethnological sources that each one is using regarding hunter-gatherers. I wish it was just that and it

As a good missionary, he knows that his nonsense has a few weak points. On page 40, he comments that, of course, there are exceptions to each of these *quasi* universalities. Like all *Homo sapiens*, foragers⁶ are complicated and variable. Various foraging societies have been documented in which women are treated poorly; in some, child abuse has been reported, and in others, selfish fools manage to wield disproportionate influence and power. But such cases are exceptional and it is often questionable whether the peoples described have been correctly classified as "foragers". Even the most remote societies have long been affected by invading civilization (through contagious diseases, air and water pollution, logging, ecological changes affecting hunting and fishing, sudden aggression from neighboring tribes, etc.).

[...] There will be those who accuse me of being a nostalgic romantic and of carefully choosing the evidence. It is understandable. The reflex action of rejecting any positive view of civilized life is a typical characteristic of civilized people, as expected.

There are several things to consider about the above:

1. They are not exceptions⁷ and indeed the author chooses the evidence carefully so that it matches his political affiliation. This is a twisted way of cajoling the reader: directly admitting that it wouldn't occur to them to cheat, only to do so next.

2. Worrying about the correct ethnological classification of primitive peoples should be something to take into account in all subjects, not just in those that Ryan likes. I explain. The rule that Ryan intends to use is that you cannot transfer a characteristic from a non-hunter-gatherer society to societies that are hunter-gatherers. Rule that he allows himself to break when it interests his political discourse. For example, he speaks thus of Jean Liedloff and her book *The Concept of the Continuum*,⁸ "his *underground* classic on parenting in hunting societies -gatherers" (p. 36). It is a basic book in its vision of natural breeding (and a reference for hippie and alternative currents), but it is not based on the study of a hunter-gatherer society. The author was inspired to form her ideas by her experience with the Yekuana of Venezuela, who are not hunter-gatherers, but slash and burn horticulturists like their Yanomami neighbors. Ryan also implies that the Taíno people Christopher Columbus encountered were hunter-gatherers, which is not true, but since they are victims of the encounter with European civilization, he is interested in counting them.

all came down to which sources offer us more reliability or credibility. The final part of the review summarizes what is at the heart of the discrepancy.

⁶ The translator of the book uses "forrajero" as a synonym for hunter-gatherer, which is nonsense in Spanish, since that term only refers to what is related to livestock feed. The term is a mistranslation for the English word "forager" that can have a meaning related to hunting and gathering food in general, not just food for livestock as in Spanish. Ryan uses "forager" and "hunter-gatherer" in reference to what his go-to anthropologists call "immediate-return hunter-gatherers," "people who don't tend to hoard food but eat what they find."

⁷ It is worth consulting "The Truth about Primitive Life: A Critique about Anarcho-primitivism" in *Technological Slavery* (Feral House, 2010, pages 126-189) by Ted Kaczynski for some of those "exceptions".

⁸ Jean Liedloff, *The concept of the continuum*, Editorial OB STARE, 2003.

3. You can reject civilization and, at the same time, also reject the idealized and biased vision of civilized life that Ryan describes for us. In fact, his vision has many civilized features and is part of a civilizing ideology, as we will see at the end of this review.

One of the most surreal parts of *Civilized to Death*'s exposition of ideas occurs when Ryan tries to discredit Steven Pinker. In response to the old dispute between Hobbesians and Roussonian, about whether the noble savage is a straw man to discredit criticism of civilization and hide the reality of hunter-gatherer societies, Ryan invents the "myth of the wild savage" (chapter 3). It seems that, according to Ryan, neo-Hobbesians like Richard Dawkins, Richard Wrangham, Michael Ghiglieri, or Steven Pinker are grossly misrepresenting the evidence to support an idea of endless prehistoric warfare. That evidence comes from three types of scientific research: the study of other primates, the anthropological study of hunter-gatherer societies, and the archaeological study of the human past. In the study of the great apes, according to Ryan, the case of the bonobos is being left aside, thus arbitrarily ruling out an alternative, non-violent, semi-hippie model when proposing hypotheses about the behavior of the common ancestor of all great primates, which would lead to different hypotheses for prehistoric humans. Since in this chapter of *Civilized to death* it seems that the author is trying to refute Pinker, a well-known and very successful science popularizer, it is worth focusing on this part of the book:

Unfortunately, neo-Hobbesian discussions of the anthropological and archaeological literature can be as limited as his forays into primatology. In her 2011 book, *The Angels Within. The decline in violence and its implications*, [183] Steven Pinker argues that the level of violence and warfare are now well below where they were during prehistory, when "raids and strife [...] characterized life in a state of nature". Without offering a single reference, Pinker lists a number of reasons why the Gatherers *had to* engage in brutal warfare:

Foraging peoples may invade for territories such as hunting grounds, watering holes, riverbanks or mouths, and sources of prized minerals such as flint, obsidian, salt, or ochre. They may steal livestock or caches of stored food. [Note: Gatherers have neither livestock nor caches of stored food, otherwise they would not be "Gatherers."] And very often they fight to get women, who gang rape and then divide themselves as wives. (pp. 113-114)

Next, Ryan comments on the criticisms of academic specialists in the fields of knowledge that are required in these topics. One reads this and has no choice but to think how badly Pinker has done it, how inept! TRUE? Well, no, if we go to the Pinker book, we will discover that Ryan is omitting much of the exposition of Pinker and his true ideas. Ryan is not refuting them, he is ignoring them and taking them out of context. Let's review a few:

1. For starters, here's Pinker's take on Hobbes: "When it came to violence in pre-state peoples, Hobbes and Rousseau talked the talk: they had no idea what life was

like before civilization. Today we have more information.” (p. 71, *The angels that we carry inside*).

2. In a section entitled “Violence in our ancestors”, Pinker also comments on the case of the bonobos and presents a few objections to considering this non-violent and semi-hippie model of a possible human ancestor. Of course, Ryan doesn’t mention them, nor does he mention that there are “specialists” who have different views on why bonobo behaviors are the way they are.

3. Ryan’s quote from Pinker’s book (p. 84) is taken out of context. It belongs to the section “Types of human societies”, where, among other things, Pinker assesses whether the examples we know of hunter-gatherer societies such as the Bushmen or the Eskimos may or may not be an adequate model for prehistoric hunter-gatherer societies. Both Bushmen and Eskimos inhabit (inhabited) possibly more difficult, harsher environments than many of the hunter-gatherer societies of the past. There is another aspect that may have influenced the hunter-gatherers of the ethnological record, contact with civilized neighbors, ranchers or farmers. In addition, Pinker evaluates what stateless and state societies are like and makes a quick review of the different anthropological categories of societies and the presence of violence in them. Until it runs into the politicization of historical and anthropological studies of violence in stateless societies. It is in this part that the quote used by Ryan is. In the immediately preceding paragraph, Pinker goes on to explain why one historian is wrong in his assertion that hunter-gatherer societies had little reason to engage in violent strife. Of course there may be reasons. One of them is stealing from neighboring agricultural or ranching societies. Ryan’s note comes to ignore this situation. And Ryan also ignores the two stories that are on the page before the Pinker quote in question. Two stories of two warrior incursions with lethal consequences for the neighbors of the protagonists. One occurred among the Australian aborigines at the beginning of the 19th century and another among different Inuit groups. Ryan literally writes “without offering a single reference”, when they are on the previous page. It takes us out of the context of understanding Pinker and misleads us about what Pinker is saying.

The thing is not here. Ryan continues that the archaeological evidence does not support Pinker’s main thesis about the decline of violence throughout human history, with the present being perhaps the most peaceful time in our species’ existence. “As Fry explains in *War, Peace and Human Nature*,⁹ “worldwide archaeological evidence shows that warfare was simply absent throughout much of human existence”” (p. 115). Next, Ryan plays the Fallacy of Authority card. He introduces us to Douglas Fry as an anthropologist specializing in the study of pre-agricultural societies. You should understand the subject, right? Then you should know how the absence of an event is tested. The absence of evidence is not proof of the absence of an event, in this

⁹ Douglas P. Fry (editor), *War, Peace, and Human Nature: The Convergence of Evolutionary and Cultural Views*, Oxford University Press, 2013.

case war. The world archaeological record is incomplete, let us remember¹⁰. Therefore, Ryan draws from an authority which, in turn, draws from a fallacy, the argument *ad ignorantiam*. And this after partially presenting Pinker's arguments to us (fallacy of incomplete proof). Here someone tries to fool someone.

On the same page 115, Ryan states that "the interpretation that I present here is not at all controversial among those who have studied hunter-gatherer societies in depth. For example, Pinker often cites Dr. Robert Kelly, who is not exactly unknown among archaeologists."¹¹ He then comments on a quote from Kelly's book, *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*,¹² which would contradict Pinker's thesis. How clumsy is Pinker! Nope? Well, no, Pinker doesn't **once** quote Robert Kelly in *The Angels Within Us* and it's not in the bibliography at the end of that book.¹³ On page 119, Ryan returns with the donkey to the wheat: "Even Kelly, from whom Pinker drew many of his figures, understands how misleading numbers can be if they are not carefully presented." No, Pinker doesn't use Kelly's figures. Use Keeley figures, Lawrence H. Keeley, author of *War Before Civilization. The Myth of Peaceful Savage*.¹⁴ But this is not the most surreal. What is most surreal is that Ryan accuses Pinker that his statistical analyzes "are as misleading as his way of presenting the information" (p. 118).¹⁵

Civilized to death aims to establish the benchmark of nomadic hunter-gatherer societies as that of healthy human societies, not only in terms of individual physical health but also the psychological and global health of a human group in a non-degraded ecological environment. However, Ryan has only managed to update the old primitivist repertoire in the style of John Zerzan. In fact, there are quite a few similarities in their way of proceeding, although Ryan does not mention Zerzan or anyone else from that particular tendency at any time. From that old primitivist repertoire, as soon as he leaves a topic untouched, all the dogmas and idealizations appear (natural upbringing

¹⁰ In order not to disperse too much, the cases related to violence that are documented in the fossil record of prehistory and their interpretations will not be touched on here.

¹¹ The next sentence is exactly this endorsement of the fallacy of authority: "[Kelly] is the author of over a hundred articles, books, and reviews, including two of the most widely used college archeology textbooks in the world. United States, and has been department chair at various universities and editor of *American Antiquity* magazine, the leading archeology publication in the United States. We'd be hard-pressed to find someone more into the mainstream culture. [...] describes hunter-gatherers as people who live in "small, *peaceful* and nomadic groups, men and women with few possessions who are equal in wealth, opportunity and status"" [italics is by Ryan].

¹² Robert L. Kelly, *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*, Smithsonian Institution Press, 1995.

¹³ Out of curiosity, I also reviewed the bibliography used in *The blank slate* and it is not cited or referenced there either.

¹⁴ Lawrence H. Keeley, *War Before Civilization. The Myth of Peaceful Savage*, Oxford University Press, 1996.

¹⁵ My opinion of Pinker's progressive theses, the real flaws they may have and the criticisms they deserve, are beside the point. What is clear is that Pinker presents the information with far more respect for his readers than Ryan does.

ing, free sexuality, unlimited idleness, pacifism, egalitarianism, etc.). Ted Kaczynski's critique of primitivism, "The Truth about Primitive Life," is very pertinent to Ryan's book as well.

Civilized to death is intended to be a form of rejection of civilization, but it is not:

The so-called progressive agenda is often in consonance with harvester values: a more equitable distribution of resources, assistance to the vulnerable, respect and autonomy for women (including equal pay and reproductive rights), an increase in funds for health and education programs, acceptance of all religions, etc. A conservative agenda often accommodates such agricultural values as individual rights over community rights, paternalistic male control of women's sexual behavior, expansionist militarism, exaltation of wealth, and monotheism. (p. 269)

[...] Although the values embedded in progressive organizations are inherent to our species, the number of groups that take advantage of the new technologies that foster these desires is still small. (p. 271)

[.] If *Homo sapiens sapiens* diverted arms spending and redirected resources towards a guaranteed global basic income that would incentivize not having children, which would intelligently reduce the world population and not coercive, we would be moving towards acceptance. Once we started down this path, each step would bring us closer to a future that recognizes, celebrates, honors and reproduces the origins and nature of our species. This is, in my opinion, the only way home. (p. 284)

After so many pages dedicated to criticizing civilization and exposing, with better or worse sense, only some of the problems that afflict us, it turns out that we reach the final pages and the conclusions that Ryan offers us come to be "support organizations already the socialist, environmentalist, feminist parties, etc." That progressive agenda, which is basically the latest version of civilizational ideologies, is the product of civilization and a tool to maintain it. Because an effective way to reintegrate the disaffected from civilization is to involve them in typical leftist causes, while believing that they are rebelling against civilization.

Collapse

(Book by Jared Diamond)[a]

This book[b] tries to answer the question of why some societies collapse and others do not. To do this, for much of the book, the author takes an interesting historical journey through different past societies that collapsed and analyzes the main reasons for their failures and the possible solutions that, apparently, each of these societies could have successfully applied. and yet he did not. In turn, the author analyzes three past societies that managed to avoid collapse by applying successful solutions. The most interesting thing about this tour is that the author covers a relatively wide range, in terms of social complexity, going from the subsistence economy of Pitcairn Island to the Mayan empire or the ancient Norwegians who settled in Greenland and then vanish.

To describe the collapse, the author sets five factors¹ that determine the collapse of a society in different ways and analyzes them for each of the cases. Once this has been analysed, the author proposes the possible solutions that could have prevented the collapse and how, despite the fact that in most cases they were apparently "easy" solutions, it does not seem that these were not even intended to be implemented. practice; Were the Easter Islanders stupid enough to cut down all the trees when this would obviously lead to a Malthusian catastrophe?

On the other hand, the author shows three success stories that could have ended in a social collapse and, however, these are societies that have survived to this day. It deals with the feudal Japan of the so-called Tokugawa period, the agricultural lands of central New Guinea and the agricultural success of the island of Tikopia.

The two most relevant conclusions that, in my opinion, can be drawn from these analyzes of failures and successes are two:

- First of all, the development of a society depends largely on the material conditions that limit it. Therefore, the possible "successful" solutions that it can take to face a possible collapse depend on its physical environment, that is, on the availability of resources and the possibility of accessing them; The latter seems obvious a priori but it is not, at least in cases where environmental conditions are extreme. For example, perhaps the society of Easter Island (an island that is especially fragile in terms of environmental deterioration and without the possibility of easy access to overseas resources) could have avoided depleting all its resources and at least part of its population could have survived. viable, but for this it would have to have decreased its population

¹ The five factors that the author considers to be decisive contributors to collapse are:

density, modified its way of exploiting resources and possibly reduced its complexity, which, by the way, would technically be a collapse. Another case remarkably limited by environmental conditions is that of Norwegian Greenland; In this case, it seems that the possible solutions to survive in the long term were to adopt the Inuit way of life, since in such an extreme climate and with such fragile soils, neither agriculture nor livestock are viable (at least, to date). , in the absence of fossil fuels).

[a] Review by G.

[b] Random House Mondadori, 2006.

- Second, some past societies were successful in dealing with serious environmental problems without the need to reduce their complexity. The author studies three such cases: Japan in the Tokugawa period, which dealt with the grave danger of deforestation it faced by imposing tight environmental control, and the agricultural successes of Tikopia and central New Guinea. In my opinion, of these three cases, the most disturbing is that of Tikopia, since due to the high population density of the island together with the high rates of plant growth, the resident society managed to avoid collapse at the cost of destroying all of Nature. wilderness of the island and turn it into a "great orchard". The obvious conclusion I draw from this is that, from the point of view of the autonomy of the wild, "success", if it can be called that, is likely to involve environmental catastrophe or ironclad regulation of the environment.

The second half of the Diamond book is dedicated to studying different current cases of societies that are currently having to face serious problems that are only likely to increase; such as the serious problems of water scarcity and soil loss in Australia or pollution in certain parts of Asia. In turn, the author mentions how probably the industrialized world in general is going to have to face global problems that will affect it to a greater or lesser extent in a general way before the end of this century. And despite the fact that the author has great faith (which seems more forced than justified) that these problems will be solved, it does not seem obvious that this will be the case.

It seems obvious that industrial society is going to experience various problems of varying severity and nature throughout this century. Industrial society is the most complex society that has ever existed, so solving its problems will not be trivial and if, as Diamond explains, some societies in the past could not tackle what seem like easy and trivial problems, even for such societies, It must not be taken for granted that industrial society will be able to solve its problems just like that. And even more if we take into account that as Tainter states, in *The Collapse of Complex Societies*^[1], the fact that a society solves a problem entails an increase in its complexity and therefore an increase in the energy *input*. If industrial society has successfully solved its problems up to now, it has been through a great increase in its complexity thanks to the energy contributions provided by fossil resources and not by magic or solely

² Book by anthropologist Joseph Tainter in which he tries to explain in a technical way the reasons that can lead to the collapse of a complex society. In his central thesis Tainter

thanks to ingenuity and intelligence. By this I do not mean that industrial society is going to fail, but simply that it is not invulnerable.

Notes proposes that societies increase their complexity since it is useful to solve the problems they face. This increase in complexity can be successful but requires a higher energy cost, at the moment in which the energy cost of increasing complexity enters a phase of diminishing returns, society is in serious danger of collapse (see "The collapse of societies Complex: Summary and Implications" and "Complexity, Problem Solving, and Sustainable Societies" on this page).

THE ECOLOGICAL AND EVOLUTIONARY CONTEXT

Although this review refers to ethnographic cases (as opposed to archaeological or ethnohistorical cases) of conservation (or lack thereof), it is instructive to analyze this phenomenon from a deeper historical or evolutionary perspective. It is equally important to look beyond our species to a larger ecological context, and briefly consider how contemporary ecologists view issues of environmental change and disturbance.

Ecology of the absence of balance

For most of the 20th century[d], the study of ecological communities and ecosystems was dominated by a set of concepts and theories that emphasized an orderly succession toward equilibrium (sometimes referred to as “climax” or “maturity”) (Smith 1984 , Winterhalder 1994).¹ This equilibrium-focused paradigm that began in the 1970s was increasingly challenged by ecologists impressed by the ubiquity of dynamic processes including

[c] “Temporary discounting” in the original. In the Anglo-Saxon sphere, it is a concept that refers to the fact of preferring short-term rewards instead of long-term (and therefore more uncertain) rewards. In the Spanish-speaking world, it is usually translated as “discount for delay”. I have opted for “rule out delay”, because it is better understood. *N. from t.*

[d] “This century” in the original. Keep in mind that this article was published in 2000. *N.* perturbations, interruptions, unpredictability, complex nonlinear interactions, and the influence of history (or initial conditions) (Pickett & White 1985, DeAngelis & Waterhouse 1987, Botkin 1990, Perry & Amaranthus 1997). Currently the dynamic or non-equilibrium paradigm is clearly on the rise in academic ecology circles, although the same is not true in environmental management and social sciences (Scoones 1999).

This revision of the concept of nature has important implications for conservation biology and for our understanding of humans in nature (Botkin 1990, Worster 1995). First, because it is now widely accepted that “species diversity is generally enhanced by disturbances that occur at intermediate levels of frequency and intensity” (Perry &

¹ Original title: *The Vanishing face of Gaia*.

Amaranthus 1997:33; but see Hubbell *et al.* 1999), it seems quite likely that anthropogenic disturbances at these intermediate levels (such as slash-and-burn cultivation with low population densities, or controlled burning to enhance the growth of herbaceous plants) can have positive effects on biodiversity.² Second, if ecological communities are always evolving, it is not clear which state or set of states to try to conserve. As fire ecologist Stephen J. Pyne (1992:2) has recently argued,

What advocates typically want to restore is “natural” fire, but the historical landscape that supports their vision of what restoration should produce was the result of thousands of years of culturally-driven fires. The mission to restore leads us to a state of permanent irony. We will never decide how far into the past to restore the earth - and we can never, in any way, really go back to that point.

In fact, there is a double irony here because habitats seen as “natural” may actually be only temporary states of a dynamic continuum, and places extolled as pristine nature - rich grasslands, for example, or a forest dominated by large, widely spaced trees - may be particularly dependent on a history of human disturbance (Anderson 1990, Gomez-Pompa & Kaus 1992).

Human dispersal and ecosystem engineering

The belief that indigenous peoples do not change, that they are “frozen in time”, living in the same place since time immemorial, is pervasive in popular culture. Anthropologists have long criticized the notion that SPEs consist of people “without history” (Wolf 1982). However, expanding this understanding to the recognition that these peoples are active agents in environmental history has been slower in coming. That recognition is developing rapidly and is changing our understanding of human ecology, adaptation, and conservation (eg, Sponsel 1992, Crumley 1994, Kirch & Hunt 1997, Russell 1997, Balée 1998).

Undoubtedly, many peoples have deep roots in certain places, and virtually all have strong ties to their homelands. However, this does not necessarily imply that they have continuously occupied a single place on the planet and made it their home for hundreds of generations. A pertinent example is that of the first peoples of North America. An examination of the distribution of Native American languages (an indicator of cultural genealogy) clearly shows that Native Americans were involved in large population movements after the original colonization of the continent and before the European invasion (Goddard 1996). Patterns such as these suggest that recurring waves of dispersal or migration can lead to a mosaic of languages and ecological-cultural diversity.

Archaeological and historical records also reveal many episodes of substitution of one population (or at least one lifestyle) by another. For example, contemporary Inuit, in-

² Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

habiting the Canadian Arctic and Greenland, are known for their ingenious adaptation to a demanding environment of low biological productivity (Damas 1984). However, their immediate ancestors, the Thule peoples, arrived in this region (from Northern Alaska) only some six to nine centuries before Europeans arrived. In addition, the Thule colonization replaced the Dorset culture that had occupied the North American Arctic for approximately two millennia - a culture that had in turn replaced the pre-Dorset Paleo-Eskimo who originally colonized the High Arctic (McGhee 1984).

The available evidence indicates that anywhere on the planet, some version of this colonization/replacement scenario has played out at least once, if not repeatedly. In fact, this basic pattern - waves of colonization spurred by technological or social innovations or environmental fluctuations, and the consequent replacement of a previous lifestyle by that of a competitively superior intruder - is now accepted by most specialists in the origins of the species of the modern human being as the constitutive history of our species (Klein 2000).

Although there is little consensus about its causes, a plausible explanation for the evolution of this colonizing strategy in our lineage establishes ecological instability as the fundamental cause (Potts 1997). The period in which the genus *Homo* emerged (the Pleistocene, which goes from approximately 1.7 million years ago to 10,000 years ago) was marked by the greatest climatic instability of the last 65 million years, including large changes in sea level, ice movement, climatic fluctuations, and subsequent habitat shifts (eg, increase and decrease of forests) (reviewed in Potts 1997). Our hominid ancestors appear to have responded to such large-scale environmental instability by developing capabilities that enhanced their ability to survive and reproduce under an ever-increasing variety of environmental conditions.

In other words, one could say that our species has specialized in being an ecological generalist, consuming an incredible variety of foods, inhabiting an unprecedented range of habitats and climates, and developing a very flexible and opportunistic range of niches (Gamble 1994). We have developed these abilities not because they are intrinsically adaptive - an anthropocentric view that leaves the evolution and persistence of countless relatively specialized and unchanging species unexplained - but because in our particular ecological context they conferred evolutionary advantages on us. In short, ecological instability may have been the crossroads from which our species emerged and the matrix in which we have thrived.

Ecosystem engineering. The secret to our species' willingness to colonize different habitats lies in the human ability to repeatedly and substantially change our livelihoods, in some cases, literally remaking our habitats in the process. Even before agriculture, humans began to alter ecosystems (eg through periodic burning) in order to capture a greater share of total biotic energy. This tactic has been so successful that it has produced an astonishing growth in the human population and an unprecedented degree of domination of ecosystems. As an example of the latter, different recent analyses estimate that between 40% and 50% of the total dietary energy

that flows through the biosphere is channeled for human sustenance or other types of consumption (Vitousek *et al.* 1997).

Although there are different means by which humans achieve dominance over ecosystems, there is one that involves different practices that have in common the physical reshaping of terrain, waterways, communities of flora and fauna, and other aspects of ecological structure and function. Following the terminology of Jones *et al.* (1994), we refer to this set of practices as *ecosystem engineering*, a term used to describe the creation and maintenance of habitats by organisms. Thus, beavers create wetlands, coral species create atolls, and earthworms create aerated soils; note that this does not necessarily imply that the engineering effects are intended or designed per se, although clearly some aspects may be.

Human ecosystem engineering on a significant scale has been around at least since our ancestors developed fire control. The work of anthropologists, geographers, historians, and ecologists is increasingly revealing about the extent to which SPEs, including preagricultural peoples, engage in habitat modification (Day 1953, Stewart 1956, Lewis 1982, Cronon 1983, Denevan 1992, Burney 1995, Fairhead & Leach 1996, Little 1996, Nabhan 1995, Russell 1997). Methods used to “tame” their environment (Blackburn & Anderson 1993a) range from intentional burning (eg, to enhance the growth of plants used by people or for grazing by deer or other prey) to planting, pruning, or even irrigation of wild edible plants, and from the construction of small dams[e] for fishing or hiding breastworks for hunting to the monumental construction of burial mounds (e.g., Steward 1933, Lewis 1982, Roosevelt 1995, Anderson 1996, Pyne 1998). With the advent of agriculture, ecosystem engineering certainly incorporated new techniques, including clearing forested areas to make orchards, fields, and pastures; build irrigation systems, sometimes on a large scale; terracing mountain slopes (Evans & Winterhalder 2000); fertilizing, plowing and other ways of amending the soil; and of course the creation of new forms of life through the interbreeding of plants or animals (reviewed in Redman 1999).

In modified ecosystems, especially agricultural ones, humans have often been the primary agents of biological disturbance (Chapin *et al.* 1997, Noble & Dirzo 1997). As discussed above, evidence suggests that environmental disturbances of moderate intensity and frequency can often enhance biodiversity (Petraitis *et al.* 1989, Perry & Amaranthus 1997). Particularly in forest and savannah environments, a history of human disturbance (such as clearing of small areas in the forest, low-intensity burning, soil modification, and moderate levels of predation) can have this effect. For example, a study of the Mediterranean dehesa[f] (Pineda 1991) found that recurrent anthropogenic disturbance favored spatial heterogeneity, and thus biodiversity, in that habitat. Similarly, Delcourt & Delcourt (1997) concluded that selective burning in the southern Appalachians by Native Americans in pre-Columbian times created “an intermediate-scale disturbance regime that produced a heterogeneous mosaic of different vegetation types” (p. 1013), thus increasing the contrast between vegetation limits and increasing the diversity (beta) of the habitat[g]. Other well-documented examples include grazing

and burning in the savannahs of East Africa (Little 1996), the “forest islands” created around towns in Guinea, West Africa (Fairhead & Leach 1996), the rich anthropic soils (*terra preta do Indio*) produced by the Amazonian slash-and-burn horticulturists (Smith 1980, Hecht & Posey 1989, Balée 1993, McCann 1999), and the burning, pruning and hunting-gathering of the Indians Miwok who helped create Yosemite’s mosaic habitat, the crown jewel of American preservationists (Anderson 1993, Anderson & Nabhan 1991).

Although such moderate disturbances can be biodiversity enhancers, the introduction of periodic burning in areas where the vegetation is not adapted to this disturbance can have irreversible effects, including the extinction of some plant species. This has recently been proposed as the cause of the sequence of habitat changes and megafaunal extinctions that occurred during the human colonization of Australia 50,000 years ago (Miller *et al.* 1999). In any case, abundant evidence indicates that dense populations and intensive agricultural production (especially commercial) tip the balance towards biodiversity loss (Chapin *et al.* 1997, Matson *et al.* 1997). *In addition, the intensification of agricultural production over the past few millennia has led to increased human dependence on a few domesticated plant species (Matson et al. 1997). In many cases, this has led to a further reduction in biodiversity in agricultural ecosystems, and at the same time to an increase in population and thus to a positive feedback loop (Image 1). When this cycle of intensification and population increase has occurred sufficiently gradually, the trajectory has been sustainable (Redman 1999: 122ff). In cases of rapid change (demographic and*

[e] “Weir” in the original. The authors refer to small dams made with branches, mud or stones to catch fish more easily. *N. from t.*

[f] “Mediterranean oak savanna woodlands” in the original. *N. from t.*

[g] See footnote dd. *N. t.* environmental) there is sometimes a trade-off[h] between total production and sustainability (eg Humphries 1993). The resulting unstable dynamics in many regions is now a cause of widespread concern (McMichael 1993, Cohen 1995, Swanson 1995, Redford & Mansour 1996).

In short, we humans are colonizers, not calm and homely people; we are always pushing the limits of our domains, expanding into other areas (even if they are occupied by other people) when changes in the environment or in the mode of production allow it. The traits driving this colonizing strategy seem to have evolved in a context of high levels of environmental instability during the Pleistocene. The strategy has been so successful that humans have colonized virtually the entire earth’s surface in a relatively short period of time and are now changing the biosphere on an unprecedented scale. Our success as a species is based on cultural innovation, competitive dispersal, and ecosystem engineering; but this success spells doom for thousands, even millions of more venerable but less adaptable species (Kerr & Currie 1995, Norgaard 1995, Reaka-Kudla *et al.* 1996, Vitousek *et al.* 1997). In this context it becomes crucial to understand the forces that have shaped human-environment relationships in

SPEs and, in particular, the conditions under which sustainable use, and perhaps even deliberate conservation, have been possible.

Habitat modification — ☒

Increased production (+ loss of diversity?)

Agricultural intensification <

Population growth

Image 1 *Positive feedback loop in agricultural intensification with loss of biodiversity as a secondary effect.*

ENVIRONMENTAL CONSERVATION THEORY

The main role of theory in science is to guide the taking and evaluation of empirical knowledge. If our goal is to understand the existence and operation of environmental conservation, then a theory of this phenomenon should tell us the conditions under which it is likely to take place, the forms it is likely to take, and its environmental consequences. These theoretical predictions should be empirically testable, unless we become so infatuated with our theoretical constructs that we fail to assess their real explanatory power. In other words, an ideal theory would offer us a coherent explanation for the variation in the form and frequency of occurrence[i] of environmental conservation that has been subjected to rigorous empirical evaluation. We currently do not have that ideal theory. However, elements of it are beginning to take shape, often in parallel across [193]¹ different disciplines. Here, we present what to us is the most promising form of that theory, synthesizing work done in microeconomics and decision theory, in behavioral ecology, and in political science.

¹ “Occurrence” in the original. *N. from t.*

What is “conservation”?

To begin with, we need to agree on the meaning of the term conservation. As pointed out in the introduction, this goes beyond mere semantic interest because the current, sometimes fierce, debate about the existence of indigenous conservation depends in part on different conceptions of the meaning of this term.

Many descriptions of indigenous environmental relationships implicitly or explicitly equate conservation with the long-term coexistence of a people, or a culture, and a set of other species or an ecosystem. In other words, the lack[j] of overexploitation, or removal of resident species, or habitat degradation is taken as a conservation diagnosis. Sponsel et al. they are effective conservationists; their societies have used and managed the natural resources of their habitat sustainably for centuries or even millennia.”

However, as many have pointed out, this view can be criticized for conflating conservation and sustainability (Hunn 1982, Winterhalder 1983, Hames 1987, Alvard 1995, Smith 1983, 1995, Low 1996). In general, it is to be expected that factors such as low human population density, low demand for a resource, or limited technology can in many cases contribute to sustainability, with some conservation as a secondary effect. To ascribe these sustainable uses to conservation implies an error in causal attribution, because one or more of the factors mentioned may probably be the real cause, while calling something “conservation” implies that it exists because it prevents the overexploitation or degradation that would take place. if it didn’t exist. Cases like the ones mentioned can be called epiphenomenal conservation (Hunn 1982), but they can also be called coexistence (of resident species) and sustainable use (of habitats).

Taking this issue into account, Alvard (1995) proposed that practices must be “costly in the short term” to be considered conservation. The essence of conservation, in this view, lies in restricting resource extraction or land use in the present (and thus reducing immediate benefits, which meets the short-term cost criterion) in order to obtain benefits. in the future. However, the cost (or delayed benefit) criterion is not sufficient, because again, it does not exclude other causes for a practice (Smith 1995). Costs due to restricted harvest may be borne in order to achieve goals other than conservation, such as allowing prey to congregate in large numbers (Ruttan 1998:48) or preventing enemy attack (Hickerson 1965, Kay 1994).). Nor does short-term cost seem necessary for conservation because there may be options that are no more expensive than alternatives but are chosen because they produce conservation benefits (e.g., tilling along contour lines rather than downhill). of the slope).

A second issue concerns effect: to be considered conservation, a practice must have a measurable effect in limiting extraction or environmental degradation. The rationale

for this approach may seem self-evident, but it is worth emphasizing because of the widespread tendency to cite the existence of beliefs about conservation, stewardship, and the reverence of nature as evidence of effective conservation (Callicott 1994). The existence of such beliefs or ideologies is an interesting phenomenon worthy of ethnographic or philosophical investigation, but it is not by itself evidence of conservation practices or results (Hames 1991). Undoubtedly, ideology can be a proximate cause of the practices of

[j] “Failure” in the original. *N. from t.* conservation and can be used in discourses around environmental practices; our fundamental idea is that if conservation refers to environmental actions, the effect of these actions should be demonstrated.

We conclude that to be considered conservation, an action or practice should meet two criteria. First, it should prevent or mitigate resource depletion, species extinction, or habitat degradation, and second, it should be designed to do so (Smith 1995, Alvard 1998a, Ruttan & Borgerhoff Mulder 1999). The first criterion, concerning effect, is simple conceptually, but raises difficulties not discussed in this article, such as the operational definition of depletion or degradation (see Meffe & Carroll 1997, Cocklin 1989). The design criterion is conceptually more demanding, since it raises questions about historical processes, causal explanation vs. the functional, agents, etc. However, it seems essential nonetheless if we hope to understand the historical processes that have shaped the relationships between humans and their environment. It also has a practical meaning, because if a history of coexistence or sustainable use is taken as sufficient proof of practices and institutions that maintain environmental conservation, then we will not be prepared if resource depletion or environmental degradation appears due to changes in factors. such as population density or market opportunities (Low & Heinen 1993, Henrich 1997, Galaty 1999).

We say “designed” to allow several different processes to play a role in shaping conservation practices. On the one hand, it may imply design based on conscious beliefs and preferences, and thus an intentional form of explanation (Elster 1983). However, evolutionary processes, whether cultural or genetic, can produce complex design, and our definition takes this into account as well. Thus, if a conservation practice could be shown to have spread or been maintained in a population because its practitioners were less likely to become extinct or more likely to thrive and spread (compared to non-conservers), it would meet the criterion. This would be the case even if the conscious reasons for carrying out that practice were not related to conservation (but to making the spirits propitious, eg). However, it is important to note that the conditions for this to occur seem quite restrictive because conservation not only implies a delay in obtaining a benefit (Rogers 1991), it also often produces a collective good (see below) that it can benefit both those who do not conserve and those who do. Probably for this reason no one has been able to demonstrate the evolution of conservation systems in non-human populations, despite past attempts such as “group selection” (Wynne-Edwards 1965) or “prudent predation” (Slobodkin 1968). On the other hand, it is possible that cultural evolution is more favorable than genetic evolution with respect

to the spread of traits beneficial to the group (Boyd & Richerson 1985, Soltis *et al.* 1995).

In short, a definition of conservation that incorporates the two criteria of effect and design is logically coherent and perhaps has practical value. It serves to distinguish deliberate conservation from sustainability due to other factors, and directs research toward measuring actual environmental effects apart from beliefs or claimed effects. This definition also highlights some of the reasons why the indigenous or premodern conservation debate has been so long-running and difficult to resolve. Some participants in that debate take sustainable use as the only criteria for conservation while others take it as an unintended side effect of other factors (such as low population density); and some take the statement of conservation beliefs or ethics as conclusive evidence of conservation, while others require data about environmental effects. Our definition poses difficult empirical and conceptual challenges. In particular, it means that conservation is inherently more difficult to verify empirically than resource depletion, since one must not only determine that coexistence or sustainable use is taking place, but also that it is due to human actions designed to ensure that end. (as is the case for any valid proposal involving adaptive functions of human behavior).

The delay discard problem

Conservation often involves taking a short-term loss for a long-term gain (Alvard 1995, Ruttan & Borgerhoff Mulder 1999). This dilemma[k] between the present and the future raises the complex question of ruling out delay, a crucial aspect in determining whether conservation is rational (Clark 1973) or adaptive (Rogers 1991, Alvard 1998a). There are two reasons for discarding future gains in favor of present ones: Postponing something increases the chances that the gain will not occur at all (because environmental conditions change, or because others go with the resource, or because the makes the decision dies); and the postponement reduces the opportunity to invest a profit in generating more profit. These kinds of reasons[195]¹ are obvious in a commodified context, where immediate withdrawals allow profits to be invested at the same rate as the rate of return. In this way, one can predict that slow-growing resources (such as whales and redwoods) that have a reproductive rate below the prevailing rate of return on capital investment will be more likely to suffer from unsustainable extraction rates (Clark 1973, Alvard 1998a). Delay discard is likely to be found in subsistence economies as well, and can be a significant deterrent to conservation because subsistence decisions always involve both types of reasons[m] mentioned (Alvard 1998a). Indeed, theory (Rogers 1994) and data from foraging decisions in other species (Cuthill & Houston 1997, Kacelnik 1997) suggest that delay discarding is a pervasive product of evolution.

¹ *Idem. N. from t.*

Despite this ubiquity, there are likely to be ecological and cultural causes for variation in delay discard rates. Briefly, these may include the following:

1. Population growth rates: stable or regressing population size reduces the value of investment in reproduction in the present versus investment in reproduction in the future (Fisher 1958, Rogers 1994); the opposite is true for increasing population size.

2. Mortality rates: low mortality reduces future uncertainty; the opposite is true for high mortality.

3. Resource renewal rate: As has already been pointed out, slow-growing resources reduce the profits that can be obtained in the future by conserving in the present.

4. Resource mobility: High mobility increases uncertainty about future extractions.

5. Mobility of capital: High mobility decreases the incentive to bear short-term costs in order to obtain long-term gains from conservation.

6. Control over future withdrawals: Those who have little control over who will get the postponed profit have less incentive to forego profit in the present.

This last point leads us directly to our next question.

Conservation and collective action

Collective action theory is a well-developed branch of political science and decision-making theory that deals with social choice (Hardin 1982). Collective action refers to any group of (two or more) individuals who cooperate and coordinate their actions to produce a result. Based on the premises of methodological individualism and rational self-interest (Elster 1983), the logic of collective action is a logic of individual, not collective, benefits and costs (Olson 1965).

A collective action problem arises when collective action is costly to the individual, but beneficial to the group (or vice versa). A common scenario in which a collective action problem may arise involves the attempt to make accessible or safeguard a *collective good* - that is, any good or service that is available to all members of some collective (eg, a village, an organization, a nation), but whose consumption by some reduces the benefit available to others (Hardin 1982). A classic form of collective good is what economists and collective action theorists call a "common use resource" (CPR) (Gordon 1954, Ciriacy-Wantrup & Bishop 1975, Ostrom 1990).

Environmental conservation raises collective action problems because it typically requires actions costly to the individual that yield collective benefits, thereby providing the opportunity (and incentive) for abuse. Hardin's (1968) famous essay on "the tragedy of the commons" implies just such a scenario, where individual herders are reluctant to bear the costs of conservation (limiting herd size) because the benefits of doing so are shared collectively. . The logic of Hardin's argument is sound, but some of the premises on which it is based can be challenged (Feeny *et al.* 1990, Ostrom *et al.* 1999). In particular, Hardin makes no distinction between situations involving free access (absence of property rights) and those involving communal property (Feeny *et al.*

1990). This omission is crucial since both theory and data indicate that resources with open access are much more vulnerable to over-exploitation than those with restricted access (Ostrom 1990, McKean 1992).

Anthropologists and non-anthropologists have documented dozens of RUC common property and management systems, many of them quite long-lived, and some with considerable evidence of explicit and effective conservation practices (Ostrom 1990, Feeny *et al.* 1990). Examples can be found in communities around the world and include everything from pastures and forests to irrigation systems and fishing grounds. Some features of the management of the RUCs seem designed to solve key aspects of the problems of collective action: socially regulated access, management norms that regulate the extraction of resources, means to control compliance with those norms, and sanctions to punish those who rape them. The ubiquity of control and sanctions in successful RUC systems strongly supports the self-interest premise of collective action theory; these would be superfluous if these types of systems arose from collectivist motivations or if they culturally reflected particular rationalities (Froemming 1999).

If RUC management systems are so effective in solving collective action problems that involve the use of resources and have apparently been invented many times independently, why is overexploitation or environmental degradation a recurring and widespread problem? First, most RUC management systems rely on relatively informal means to control and penalize free riding and other violations of management rules. However, these become ineffective as group size increases, a phenomenon well studied in the collective action literature (Olson 1965, Hardin 1982, Taylor 1987, Boyd & Richerson 1988). As population density and political centralization increase, communities may exceed the size and homogeneity necessary for endogenous communal management systems (Singleton & Taylor 1992). Second, where they have managed to persist, small-scale RUC systems are vulnerable to competition from larger and more powerful economic and political systems.

The problem we face today is not so much the tragedy of the commons (although open access systems still persist in important spaces, such as the atmosphere and open sea fisheries), but rather the removal of myriad management systems. small-scale communal ownership involving socially regulated access (Feeny *et al.* 1990). The giant pair of centralized governments and sprawling commercial interests—often working in collusion—can undermine local resource management and rapidly increase government-driven resource extraction across the globe. the market.

The dynamics have been well studied in forests in areas of South and Southeast Asia (Gadgil & Guha 1992, Alcorn & Molnar 1996, Padoch & Peluso 1996). Managed for centuries by villages and other collectivities, some systems have suffered expropriation by colonial and post-colonial government plans to extract commercially valuable resources or to combat what they see as the dangers of deforestation due to local use. However, this type of external control can destroy incentives for community management and lead to overexploitation, both by outside commercial interests and by local people (why keep something if it is going to be taken away by from outside?).

Once mined in this way, it is difficult to re-establish effective RUC management systems, especially due to increased local demand for natural resources due to increased involvement in market economies, as well as population growth.[4]

Predict conservation

We have defined conservation as those practices that are designed to prevent or mitigate the extinction of species or the degradation of habitats. This definition implies a design process, either intentional or evolutionary. In turn, these practices involve processes of decision-making or adaptation by natural selection (of culture or genes) which, together with the theory summarized above, allows a series of predictions to be made about the conditions in which it is likely that conservation takes place:

1. Controlled or exclusive access (stable land rights);
2. Distinct or confined resource populations (to which access is controlled);
3. Resource populations that replenish or renew rapidly (thus likely to respond well to management controls);
4. Low discard rates, so that the value of extraction sustained over time exceeds the value of immediate extraction;
5. Social parameters (eg, small size and stable composition of the group) and institutions (that control and sanction) that combat abuse.

By contrast, the following set of conditions make deliberate and effective conservation much less likely to emerge or be stable:

6. High demand from foreign markets;
7. Rapid population growth;
8. Acute shortage of resources;
9. Adequate substitutes for threatened resources;
10. Acquisition of new technology or migration to new habitats;
11. Ease of relocating production (expandable borders, capital mobility).

With these expectations in mind, let us now turn to the ethnographic evidence.

ETHNOGRAPHICAL EVIDENCE

The theoretical arguments discussed above offer us some predictions about the conditions under which local environmental conservation systems would emerge and be endogenously maintained. These arguments suggest that while those conditions are quite restrictive, a broader range of conditions could lead to sustainable resource use. Because of the paucity of studies that provide comparable data, it is currently not possible to systematically examine ethnographic records to determine empirical correspondence with theoretical predictions. For this reason, we present summaries of various cases, organized into two categories: practices designed to conserve species or habitats, and cases of sustainable use (coexistence and not degradation) but without design evidence for conservation. The cases discussed here are representative of the range of possibilities, but not necessarily the actual frequency in each category.

Practices designed to conserve

Following the arguments summarized above, we include cases in this category if the individuals involved make it clear that the practices in question are aimed at conservation or if those practices display design elements that are costly or complex and unlikely to have arisen for different purposes. to conservation. Various practices of this type are described in the ethnographic literature and we have grouped them into different categories. However, in almost no case are there sufficient data to determine whether or not the conservation effect criterion is met.

Restriction of extraction that supposes a reduction in production in the short term[n]. The type of resource use that most clearly meets the design criteria for conservation is the restriction of extraction that implies a reduction in production. However, it has rarely been documented (with the obvious exception of domesticated resource management). Descriptions of native North American foragers leaving behind small roots and corms[or] (or portions thereof) during the harvesting process (Anderson 1996) might be one example, but there may be other reasons for the practice.

Sometimes the restriction of extraction is motivated by a belief in supernatural sanctions. Thus, Kayapó honey collectors in the Brazilian Amazon leave a portion of the honey, pollen, and honeycomb in the hive to appease the deity *Bepkóróróti*, who encourages the bees to recolonize the hive (Posey 1998). Although the intention to conserve is absent in this case, Posey argues that design for conservation is present. However, he also relates that honey collectors gain access to the hive by cutting down

the tree; this is sure to hasten the decomposition of an excellent breeding site[q] (a hollow log), and leaves the partially destroyed hive accessible to ground-dwelling predators. This, at best, renders the conservative effect of partial harvesting from the hive doubtful.

Another recent study dealing with restriction of subsistence harvesting describes the limitations placed on the hunting of the Rocky goat[r] by Northwest Indians[197]¹ Gitksan and wet'suwet 'in. It includes the group defense of hunting territories and the regulation of hunting within each group by the local chief (Gottesfeld 1994:468). Since goats are localized and have low dispersal and reproductive rates, they can easily end up being overhunted. Gottesfeld argues that chieftain control over hunting was a necessary and effective form of conservation. Although he does not present quantitative data on hunting practices or the biology of the Rocky Mountain goat, Gottesfeld does mention a local myth that recounts an uncontrolled slaughter of mountain goats followed by their revenge on human hunters. Despite the crucial lack of evidence, the existence of territorial control and centralized sanctions, in addition to the lack of suitable substitutes for goat's wool in the traditional economy, lend some plausibility to the conservation hypothesis. Here, the existence of design elements to mitigate the abuse problem, plus the vulnerability to local extinction of mountain goats, serve to lend strength to the conservation argument. By contrast, most of Gottesfeld's other arguments for conserving Gitksan and Wet'suwet'en game do not meet the design criteria for conservation (see below).

Many claims about purported extraction restrictions fail to provide any evidence other than vague assertions about a likely preservative effect. For example, Posey (1998) presents the observation that the Kayapó avoid schools of minnows for fear of *mry-ka'ak*, a 20 meter mythological serpent, to argue that they thus preserve a basic component of the river food chain. Posey's argument is that conservation intent or consciousness is not necessary for conservation to take place. You may be right, but we certainly need more evidence than is presented in this case. Although a more detailed ecological study may confirm that this conservation is an effect of the Kayapó beliefs about *mry-ka'ak*, there are many other possible reasons for the existence of this belief. A convincing argument to show that the conservative effect explains a practice requires careful attention to design features and consideration of alternative hypotheses. We, however, do not see how a practice that sacrifices short-term profits for the fishermen (assuming that the Kayapó were able to catch these small fish efficiently) in order to benefit a freely accessible common resource (the food chain of the river) can emerge and spread.

Even more problematic is Gottesfeld's (1994) interpretation that the bottleneck created by salmon processing efforts for storage in the Northwest Coast Indian fishery

¹ "Pacific Northwest" in the original. It refers to what is now British Columbia (Canada) and bordering territories (Oregon, Washington, Alaska...). Normally it refers to coastal areas, but the two ethnic groups they mention are more from the interior. *N. from t.*

functions as a limiting factor in catches, and thus as a conservation factor for salmon. Although it is true that the limitations imposed by the processing meant that much more could be caught than could be preserved, it cannot be inferred that the processing was designed to conserve the fish population. Contrary to Gottesfeld, we argue that by developing ways to preserve fish, Northwest Coast Indians increased rather than limited fishing, motivated to catch enough fish to smoke and serve as a main course for many months of the year (although there is no evidence that this increase was enough to deplete the salmon). Gottesfeld (1994:453) reports that when a Gitksan elder was asked about traditional fish management and conservation practices, he replied that "all fish remains must be returned to the water. That's all it takes to renew the fish." This supports the conclusion that salmon conservation was neither practiced nor necessary in the indigenous fishery.

Inuit hunter-gatherers with whom one of us worked described a conservation practice, avoiding hunting geese with young (Smith 1991:282), but no observations were made to confirm or refute that claim. Fienup-Riordan (1990) presents the opposite practice, the hunting of baby geese and flightless geese, as a regular activity of Yup'ik Eskimos in western Alaska; and Burch (1994) cites various non-conservation hunting practices of northern hunter-gatherers. Even simple claims that harvest limitations occur are rare in the ethnographic literature, found in only 5% of 122 cases in a recent comparative study of different cultures (Low 1996:359).

Extensive observational data from a variety of tropical subsistence hunters consistently indicate that their subsistence decisions are designed to maximize hunting efficiency (catch per unit time spent hunting), typically contradicting predictions based on prey conservation (Hames 1987, Kay 1994, Vickers 1994, Alvard 1995, FitzGibbon 1998). For example, hunters preferentially pursue species that produce high yields, regardless of their vulnerability to extinction; they ruthlessly hunt females and young individuals of reproductive age; often respond to decreased prey numbers by intensifying hunting; and they distribute the hunting effort by area in proportion to its profitability instead of being based on the abundance of prey or the capacity of the population to recover. Similar results have recently been described in the Solomon Islands artisanal fishery (Aswani 1998, 1999).

It is important to clarify that just as sustainable use does not necessarily indicate conservation, lack of conservation does not necessarily indicate resource depletion. Sustainable harvest levels are often the result of Winterhalder & Lu's (1997) simulation model of the ecology of predator (hunter-gatherer)-prey populations, despite the fact that the model assumes that human decisions are guided purely for the purpose of optimizing extraction. Various quantitative studies of subsistence hunting-gathering indicate that predation on most prey populations appears to be within sustainable levels. For example, Hill (1983) tested the claim that the !Kung San limited their reproductive rate and hunting intensity to prevent overexploitation of the prey supply (e.g. Harris 1979:81) and found that the !Kung take less than 1% of the biomass of large local herbivores, while the maximum levels of sustainable hunting of these species

is between 10% and 20%. In this case, as in others, the most likely explanation for the low capture rates is that the yield from hunting using indigenous technology is too low to motivate higher capture rates.

Some direct evidence of this is beginning to accumulate. Using source-sink models[t] and careful analyzes of hunting pressure and prey abundance, Hill, Padwe, and their collaborating Ache Indians have recently shown that the Ache hunt a very small and sustainable proportion of the total of the population of the nine most important prey species (Hill *et al.* 1997,2000). However, in the case of the Ache and others, detailed ethnographic evidence indicates that subsistence hunting by indigenous hunters can lead to localized depletion (Alvard 1994, Vickers 1991, Peres 2000) or even regional extinction, as was the case with Inuit musk ox hunting after the introduction of rifles (Burch 1997, 1994). In sum, evidence of the impact on fauna by SPEs indicates that conservation is absent and that depletion is sometimes a consequence. Exceptions to this occur in cases where hunters control access to hunting grounds (Feit 1987), consistent with one of the predictions listed above. However, the evidence that subsistence hunting decreases prey populations (eg, Kay 1994, Peres 2000) does not show that the net effect of human predation on biodiversity is negative. First, a localized depletion will be offset by a nearby population increase (Hill *et al.* 2000). Second, by functioning as key predators[u] (Paine 1996), humans may avoid excessive competition among prey species or (indirectly) among other members of the ecological community (Simenstad *et al.* 1978).

Protection or propagation of species that are a resource. Another form of conservation involves practices designed to protect or propagate resource species. A multitude of such practices have been described in the hunter-gatherer Indians of North America, including the irrigation of wild grasses[199][], the deliberate dispersal of wild plants used for food or medicine both broadcast, and sown with other modes or in some cases transplanted, as well as periodic burning to control plant disease outbreaks (reviewed in Anderson 1996, Blackburn & Anderson 1993a). It is interesting to note that all these examples refer to plant resources, in contrast to the few cases of hunting restrictions or wildlife protection.

Avoid harmful habitat modification. As stated above (and will be documented below), habitat disturbance does not necessarily lead to environmental degradation or biodiversity loss and, in fact, can increase biodiversity. However, it is obvious that some habitat types are more sensitive to the effects of modification than others. Hence, avoiding or mitigating this type of habitat change may constitute a form of conservation, as reflected in the environmental regulations and legislation of many industrialized societies. Do SPEs show analogous controls designed to conserve with respect to habitat modification? If so, they seem to have been neglected by the ethnographic literature. A possible example is found in several Indian societies in northwestern Amazonia, which avoid slash-and-burn horticulture on riverbanks, thus preserving gallery forests that enhance aquatic productivity (Chernela 1989, Beckerman & Valentine 1996). . Although

this is apparently carried out to maintain the productivity of the fishery, it is a possible case of conservation that would imply short-term cost.

Another proposed example of indigenous habitat conservation includes several instances of sacred groves. Although many of these cases occur in long-standing state societies, and thus are outside the scope of this article, Olofson[w] (1995) has recently published an interesting article on sacred groves in the Philippines and found that protection of sacred groves was “a latent function of ... religion, and thus a soft form of conservation” (Olofson[200]² 1995:29). There was no indication that local protection responded to the general preservation of the forest, but rather responded to “the protection of themselves and their children from spirits in the environment that cause diseases,” a relationship he calls “incidental conservation” (Olofson 1995:29)[y].

Restriction of human population growth to match the resource base. Although protection of environmental resources is the obvious path to conservation, supply and demand can be kept in check by reducing consumer demand, as contemporary advocates of population control point out. Most of the claims we have examined about human population control to prevent resource exploitation confuse secondary effects with real causes (as discussed in Bates & Lees 1979, Dewar 1984, Smith & Smith 1994). However, under special conditions - highly circumscribed populations, effectively centralized or with communal sanctions - such control can be achieved. One of the few adequately documented cases is the Polynesian chiefdom of Tikopia. Tikopia showed clear population controls that included celibacy, contraception, infanticide, abortion, and periodic forced emigration (Firth 1936, Borrie *et al.* 1957). This coupled with intensive horticulture and arboriculture, as well as centralized controls (by chiefs) over marine resources limited resource consumption to sustainable levels for many centuries (Kirch & Yen 1982, Kirch 1997).

However, Tikopian practices did not generally conserve native terrestrial species, and in fact the initial occupation was followed by extensive deforestation, increasing soil erosion, the extinction, at least locally, of at least six species of birds, and the depletion of marine and terrestrial fauna (Kirch 1997:37). Finally, the Tikopians adopted a sustainable production system that emphasized arboriculture, creating a habitat so highly anthropic that “virtually the entire surface of the land is covered by these orchards with trees that are valuable for their economy... that protect and shade the intensive plantations of yams and other crops that grow under their canopies” (Kirch 1997:35). Therefore, the Tikopians did not conserve the original biodiversity or specific resources, but rather a highly modified agroecosystem (as well as the marine resources of the reef and lagoon, whose exploitation was limited by the authority and sanctions of the chiefs).

² *Idem N. del t.*

Sustainable use without conservation

We have suggested above that PES have developed many practices designed to improve livelihoods, so that habitat or biodiversity conservation is a by-product – in other words, those practices would be pursued whether or not they had conservation effects. As in the cases of design for conservation, it is convenient to group these ethnographic examples into different categories.

Adjust extraction to needs. Claims that people only extract what they need or can fully use are commonplace in popular indigenous conservation literature. Nelson (1983:200) quotes a Koyukon Indian woman as saying “people never kill animals for no reason, because they know there are times when they really need to kill everything they come across”. This is a rational position, and it may well have a moral dimension that includes a social contract with the immortal spirits of animals (see below), but we question Nelson’s conclusion that this statement “summarizes an important element of human interactions.” of the Koyukon with nature - the ethics of conservation and its associated practices”. Avoiding wanton destruction of unnecessary prey is not the same as restricting catches below present wishes, and does not demonstrate conservation design. After all, since extracting additional resources usually requires effort, even in economies of scale, refraining from doing so will usually save time and effort. In turn, responding to acute shortages by intensifying hunting pressure – “kill whatever you find” – means that resource depletion is more likely to occur precisely when local prey populations are at a low ebb. Of course, harvesting more than consumption demand could sometimes be very low cost or even unavoidable, as in the case of driving bison off a cliff, where the unpredictability of herd size makes it difficult to control the size of the herd. number of deaths (Wheat 1972).

So, adjusting the extraction to the needs of the present is not valid as conservation, although it may have the effect of minimizing consumption. Taking full advantage of each extracted element can have that effect as well, but again, the conservative effect seems haphazard. When resources are scarce, the marginal costs of extracting them (due to increased search time) are higher, and then the efficient response is to invest more work in obtaining more value from each element extracted (Jones & Metcalfe 1988). Practices such as splitting bones to extract the marrow and boiling them to extract fat are common observed responses. Conversely, when resources are plentiful, we can expect to see less frugal utilization; for example, during periods when caribou populations were high, Inuit sometimes killed a dozen or more animals per household each fall for fresh pelts for blankets and clothing, leaving the meat to rot (Kelsall 1968).

Regulate the start or duration of extractions. Controls that establish the times of extraction of resources, as well as who has the right to participate, are widespread in SPEs . They occur, for example, in near-shore fishing grounds, for example in the case of the shell fishery[z] of the Kei Islands of eastern Indonesia (Ruttan 1998). As Polunin (1984) argued about these systems in general, in the cases Ruttan studied, the goal

seems to be to maximize economic control by locals, rather than to conserve resources per se, although the latter may be an unintended consequence. . On the other hand, regulating the start of a harvest can sometimes be something designed to maximize the yield of labor time (eg, waiting for schools of fish to gather in large numbers), and thus can actually increase extraction rather than restrict it (Polunin 1984). A good example of this is the bison hunt practiced in the past by North American Plains Indian tribes such as the Cheyenne. The start of the summer tribal hunt was carefully regulated by a specifically appointed “camp police” and anyone tempted to run ahead (and thus get a good personal catch, but scaring off the herd before the others could participate) would receive severe penalties. such as public beatings and the destruction of their horses and hunting equipment (Hoebel

“Trochus shell” in the original. It refers to gastropods of the genus *Trochus* that have a layer of mother-of-pearl and a pearl on the shell. *N. from t.* 1978: 58f).

Limitations on the duration of extractions are better candidates for conservation design, but appear to be comparatively rare in the ethnographic literature. A related practice, restricting the intensity of hunting-gathering immediately after successful harvesting, has often been considered a conservation practice. Thus, Beckerman & Valentine (1996) relate that among the Arawak and Eastern Tukanoan peoples in northwestern Amazonia, it is generally believed that one should rest for a few days after a successful capture to avoid supernatural penalties for immoderation. These authors propose that this practice protects vulnerable fish and game stocks, but do not provide data on actual conservation effects, nor do they consider alternative hypotheses. For example, since the social context of hunting-gathering in these communities involves communal sharing of most of the catch, hunter-gatherers may take turns avoiding excessive freeloading and parasitism at the expense of their efforts.

Zone change to maximize overall throughput rates. Coexistence of hunter-gatherers and their prey, rather than total or local extinction, is commonly observed. Many have used this as proof of the existence of conservation, but as suggested above, this is not enough because this coexistence may be due to other causes. One prominent alternative discusses the advantages of leaving an area (i.e., an area in which resources are concentrated) before it is fully depleted, given the likelihood of higher hunting-gathering yields elsewhere (Winterhalder 1981, Smith 1983). The hunting-gathering strategy model known as the Marginal Value Theorem (MVT)[aa] (Charnov 1976) makes several predictions concerning zoning, movement, and time distribution. The key, in our case, is that a hunter-gatherer who wishes to maximize removals per unit of time spent hunting-gathering should leave a given area when the marginal rate of return (the rate of removal expected during the next short fraction of time) is below what can be obtained by traveling to another less depleted area. Thus, assuming that there are enough alternative zones, and assuming that zone depletion follows a curve of diminishing returns, TVM predicts that an efficient hunter-gatherer will generally leave an zone well before total resource depletion occurs.

Smith (1983) suggested that this pattern of decision making might explain the “rotation of hunting territories” described by Feit (1973) and others among the Cree Waswanipi Indians. Feit (1987) countered with more detailed evidence which he argued demonstrated active management (conservation) of moose, beaver, and possibly other resources by the Waswanipi. Obviously, if hunters can be sure that their hunting grounds will not be “poached” by others, long-term management and costly short-term restrictions in the service of long-term sustainable yields could be in keeping with your interests. If such a system works in the Cree of recent decades, it surely differs substantially from the more mobile and opportunistic pattern of land use and hunting intensity described in texts by Jesuit missionaries and explorers of the 17th and 18th centuries (Leacock 1954). , Krecht 1999:200ff).

Indeed, ethnohistoric evidence (Brightman 1987 and 1993, Krech 1999) indicates that “current conservation ethics and practices were absent among the Northern Algonquians until certain historical conditions arose after the arrival of Europeans primarily interested in dominating the Northern Algonquians. Indians economically and spiritually” (Krech 1999:206). Instead, what prevailed was an animistic belief system that viewed prey as inexhaustible but success in capturing it as dependent on social reciprocity involving ritual forms of respect (e.g., in the handling of carcasses and in the care of the bones of the dams). Within that belief system, the way to ensure abundance of prey was to kill as many as possible and consume them with respect, so their reincarnated souls would encourage future ones.

[aa] “Marginal value theorem (MVT)” in the original. *N. t.* prey to offer themselves to hunters in ever larger quantities. In some cases, hunters claimed that refusing to kill animals that had come within range was disrespectful and would lead to decreased hunting success (Brightman 1993, Krech 1999). Fienup-Riordan (1990) has detailed a similar set of beliefs and practices among the Yup’ik Eskimos thousands of miles west of the Algonquin range although, as with the Algonquians, explicit conservation beliefs and practices have emerged as a result of Western influence (Zavaleta 1999).

Although TVM is normally applied only to hunting-gathering contexts, its essential logic can be applied to any production system. Thus, herders often move their herds to better grazing areas before the area they are in has been completely depleted (Ruttan and Borgerhoff Mulder 1999 and commenters). These types of decisions are analogous to those of hunter-gatherers leaving one area to seek higher yields in another area, consistent with TVM forecasts. Similarly, slash-and-burn farmers generally stop cultivating a plot after one or a few years, allowing soil and forest nutrients to regenerate in the fallow season. Clearly, this practice avoids environmental degradation, but again this change of zone seems to be designed to maximize productive yields rather than to conserve the forest or the soil.

If zoning for efficiency reasons results in sustainable hunting, grazing, or slash-and-burn horticulture, does it converge with design for conservation, making the distinction a sterile “academic” debate? We think not, because TVM predictions or similar logic are bound to differ from those of conservation at the most important time: when pres-

sure on environmental resources is high. Thus, if for some reason (e.g., climate change, gradual overhunting, hunter-gatherer population growth, territorial restrictions from encroaching state systems) per capita abundance of prey declines, hunter-gatherers, following According to TVM logic, they will stay longer in each zone (because there are fewer attractive alternatives that tempt them to leave), and this can lead to progressive exhaustion (Broughton 1994, Vickers 1994). Similarly, during regional droughts, efficient herders will have little incentive to seek out greener pastures that do not exist, so overgrazing is more likely, although in most cases pastures recover quickly once the rains return (Galaty 1999). Similarly, a shortage of uncleared forest, whether due to internal population growth or external competition, can lead the slash-and-burn farmer to shorten the fallow period to unsustainable levels, resulting in the conversion of the forest to prairie or other degraded habitats (Uhl *et al.* 1982, Richards 1996: 284). On the contrary, it would be expected that practices designed to conserve could prevent the development of these scenarios.

Anthropic practices that create habitat mosaics. Although most of the anthropological debate on conservation in SPE has focused on restricting resource extraction, a few researchers (primarily ethnobiologists and restoration ecologists) have taken another approach. Building on the growing consensus among ecologists that moderate and repeated disturbance can increase biodiversity at the species, habitat, and landscape levels, these researchers have studied the ways in which SPEs and indigenous societies contribute to these disturbance regimes. As we said before, recurrent controlled burning is a very widespread type of anthropogenic disturbance, but other types have been described as well. For example, by cutting down large trees to collect honey, the Kayapó create spaces that are colonized by many species dependent on gaps in the forest. Posey (1998:105) states that “...the felling of a large tree provides an immediate source of honey and offers a new ecological niche for useful plants that develop creating durable hunting ground”. Similarly, data reviewed by Little (1996) indicate that East African savanna habitats have been heavily shaped by subsistence grazing and hunting-gathering practices over the last few millennia. In particular, maintenance of grasslands through burning and grazing has prevented encroachment by bushes and thus has also helped maintain a high density and diversity of wild ungulates.

One of the most carefully documented cases of anthropogenic enhancement of biodiversity through the creation of habitat mosaics is that of the Ka’apor slash-and-burn fallows (Balee 1993). In a comparison between fallow and primary forest, Balée shows that they differ significantly in tree species composition but have equal diversity. These findings strongly support the view that these anthropogenic forests have increased regional biodiversity. Interestingly, although fallows have a much higher proportion of significant food species compared to primary forest, Balée finds that the ka’apor do not intentionally produce that result; instead, most fallow species are introduced or dispersed by animals attracted to gaps. He concludes, based on this and other evidence, that “the agroforestry complex of the Ka’apor ... appears to be derived from the development processes associated with the semi-sedentary and egalitarian societies

of the Amazon - it is simply not a product of design by design. long term, indigenous or not" (Balée 1993:248).

CONCLUSIONS

We have defined conservation as those practices that are designed to prevent or mitigate the depletion of species or the degradation of habitats. This definition implies a design process, either intentional or evolutionary. Likewise, these processes include mechanisms for decision-making or adaptation by natural selection (of culture or genes) that allow a series of predictions to be made about the conditions in which conservation is likely (or not) to take place, as noted above. Although the state of the ethnographic record does not allow a systematic evaluation of these predictions, the sample analyzed in the previous section seems consistent with all or most of them. In particular, deliberate conservation is seldom evident in game species, especially big game, whose high mobility often precludes local control over access and thus dilutes the benefits of restriction. In contrast, most cases of deliberate conservation (ranging from limiting extraction to encouraging population growth of the resource) found in our survey of the literature refer to plant resources or habitats. Furthermore, since conservation is likely to affect only certain habitats or resources, the presence or absence of conservation practices is not an indicator of overall human impact on ecosystem processes and biodiversity.

Many will question a definition of conservation that requires evidence of intent or design; But the alternative, calling limitations on rates of extraction or environmental degradation conservation, is problematic. First, it suggests a solution where there may be no problem, such as in many cases where human environmental pressure is too light or sporadic to cause irreversible biodiversity loss or habitat degradation; evidence indicates that this is often the case for SPEs that are not involved in commercial extraction and have a low and stable population. Second, without design criteria for conservation, analyzes are subject to the problems stemming from the functionalism that often plagues the social sciences (Elster 1983), including ecological anthropology (Smith & Winterhalder 1992). Many practices and beliefs can have the effect of reducing harvest rates or environmental impacts - going to church on Sundays, avoiding dangerous areas near enemy territory, or inventing a movable-tipped harpoon[bb] that makes it more likely that a seal wound can be claimed instead of escaping to die later. However, these effects are not the reason why these practices are carried out, and the environmental benefits in such cases are usually too diffuse to motivate individuals to adopt them.

The meaning and cultural practices of "conservation" that are dominant in the [bb] "Toggling harpoon" in the original. *N. of the T.* current historical moment focus on the preservation of biodiversity (of species and higher levels) and the function of ecosystems. This approach to conservation hinges on a set of political, economic,

and intellectual realities with few parallels in human history. The conservation of biodiversity per se and the preservation of wilderness[cc] for recreation or aesthetic admiration are goals that may make sense to the urban elites of industrial society (Guha 1989, 1997). However, subsistence-based societies, especially small-scale ones, are alien to such concepts. After reviewing a large number of community-based conservation programs, Little (1994: 350) concludes that “instances where local communities in low-income regions manage their resource bases with conservation as the primary objective - for ahead of the improvement of economic and social well-being - are practically non-existent”. Instead, members of such societies are likely to seek to increase the resources necessary for their sustenance, for the defense of their lands from exploitation by outsiders, and for the distribution of subsistence efforts over the most suitable areas and resources. profitable available at that time. These decisions often have the effect of conserving habitats and biodiversity, but they need not be designed to do so and can sometimes have the opposite effect.

There are many serious political issues at stake in debates about indigenous conservation, property rights, and economic change. There is no doubt that “coercive conservation” (Peluso 1993, Hitchcock 1995, Zerner 1996, Neumann 1998) can be a major threat to indigenous rights. Our critical examination of the indigenous conservation debate is not intended to support those who believe that conservation programs take precedence over human rights, or that environmental protection justifies disempowering SPEs politically and economically. Indigenous rights to their traditional territories and the use of their resources should not be based on environmental conservation (Stearman 1994). Conservation is not the criterion for property rights used in modern states, so it is both hypocritical and unfair to impose it on already marginalized and often impoverished peoples.

A more realistic and restrictive understanding of indigenous conservation not only improves social (and environmental) science, it can also bring benefits in the field of environmental law and policy. Expectations based on overgeneralization or idealization concerning the foundations of indigenous or PES beliefs and practices can lead to anger and mistrust when these are not met, as can be seen in the revealing article by Conklin & Graham (1995) about changes in relations between the Kayapó Indians and ecologists (see also Stearman 1994). As we move closer to a more realistic and nuanced view of human-environment relations in SPEs, the actual achievements of these peoples in achieving their livelihoods in a generally sustainable way, sometimes by deliberately conserving or enhancing species and habitats, become more remarkable and worthy of being understood and respected.

Grades:

1. By “small-scale society” we mean one that maintains political autonomy at the level of one or a few local communities and therefore consists of a few hundred or a few

thousand inhabitants (Bodley 1996: 12). There is little consensus on the meaning of “indigenous”. We are not going to define it, but this has little effect on the arguments we discuss here.

2. By “ecological community” we simply mean a set of organisms that coexist in a given area, without necessarily implying any temporal or spatial integrity. “Ecosystem” simply adds abiotic elements to a community defined in this sense.

[cc] “Wilderness” in the original. *N. from t.*

3. Biodiversity has different meanings in the conservation biology literature (Meffe & Carroll 1997). Usually refers to species richness (number of species in a given area). This, in turn, can be broken down into species richness within a given habitat type (“beta diversity”) and across different habitats (“gamma diversity”). Habitat disturbance can increase gamma diversity, and in the long term can preserve higher levels of total biodiversity by allowing species to persist in early successional habitats that would otherwise perish from competition with other species. the species of the last phases.[dd]

4. Although these generalizations are broadly applicable, the distinction between local forest management systems and external and larger systems, as well as the premise that local forest management is always sustainable, are currently being debated and revised based on historical research and anthropological (eg, Fairhead & Leach 1998, Sivaramakrishnan 1999).

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The translator has not been able to consult the work on which the authors are based, but the given definition of beta biodiversity is either not very precise or does not correspond to the use made of this concept in American universities. There are different meanings, but it is normally used to compare the biodiversity of two places, that is, it is a comparative tool. Gamma biodiversity usually refers to regional biodiversity, ie composed of different habitats and ecosystems. *N. of the T.*

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THE INTELLECTUAL GROSSES OF CONSTRUCTIVISM

When it comes to expressing how the natural world is represented, constructivists show a weakness for formulations biased in favor of social constructivist conceptions. Metaphors for human labor abound when it comes to creating knowledge—familiar examples are building, constructing, assembling, manufacturing, inventing, or producing knowledge. Such a vocabulary intensively exploits the generally assumed distinctions between nature/natural and culture/artificial, and through its semantics cloaks them in constructivism—namely, that knowledge is primarily man-made, not imparted by nature. Another cunning vocabulary used in regards to knowledge creation is that of suing, contesting, and negotiating—a semantics carried over from political and legal affairs and designed to interpret knowledge as perennially provisional or, to quote again the constructivist language, “contingent”. Finally, when it comes to expressing how nature is represented, constructivists tend to show a weakness for attributive formulas: they maintain that human beings assign, impute, or attribute meaning to the natural world.

In short, the constructivist analysis of nature is described as “an interest in how people *assign* meaning to their world”.¹ This type of discourse is so automatically associated with constructivism that it is also used when explaining its perspective: “We cannot experience nature except through the lens of the meanings *assigned* to it by particular cultures”, writes environmental ethicist Anna Peterson.² The choice of the verb *assign* is implicitly presented as a neutral descriptor of the relationship between representations and nature. However, this semantic decision is neither neutral nor unequivocal. Not only is this term biased towards constructivist conceptions, it also carries with it the assumption that people act on an existentially different plane from the natural world; and it imposes itself on multiple linguistic games³ that describe the way in which knowledge and the natural world are related. These aspects are developed below.

¹ A couple of examples:

² For example: “*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*” (*The Earth runs out*, pages 246-247).

³ “Language games” in the original. *N. of the t.*

Constructivist thinkers sometimes admit that nature itself limits the way it is represented—arguing, for example, that knowledge is “hybrid” or that it is “co-produced” by cultural processes and natural constraints. But there are two things that subsequently nullify this vain gesture of what David Demeritt calls “restricted constructivism”⁴ regarding the decisive power of the natural world. First, in the analyzes themselves, most of the attention and interest shifts to the economic, the discursive, the rhetorical, the networks, and other sociocultural factors through which representations (always “contingent”) are supposed to be built, negotiated, contested⁵, registered⁶, etc. Second, in the (meta-)descriptions of the constructivist project, semantics are employed that surreptitiously support a human-centered point of view—as is the case with “assigning meaning” to nature: from the outset attributive ways of formulating the relation between representations and nature *affirm* plainly that the creation of meaning is a one-way affair: from human realms to the natural world.

The idea of assigning meaning to the natural world assumes a standpoint separate from it. While constructivists claim that representations can only be created from concrete points of view - that a “view from nowhere” is chimerical⁷ - at a more fundamental level, by suppressing the substantial role that nature performs in the way it is represented, constructivists existentially divorce the human perspective from the natural world and describe the creation of meaning as acts of delegation arising from alliances, competition, negotiations, networks, rhetoric, or techniques of representation. the human realms. Overtly or implicitly, the natural world is portrayed as mute, intrinsically meaningless, ontologically indeterminate, epistemologically unworkable, and aesthetically indefinite—white noise⁸, which prior to interpretation exists well as

⁴ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁵ “Answered” in the original. *N. of the t.*

⁶ “Black-boxed” in the original. *N. of the t.*

⁷ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out*, page 237).

⁸ White noise is a random noise that has the same power spectral density throughout the entire frequency band. *N. of t.*

the proverbial buzzing, radiant confusion[212] or as an elusive swindler susceptible to being recognized in imprecise ways. Nature becomes narrated, theorized, inventoried and understood - given a meaningful existence - through human activity. Before this representational animation, the natural world has no intrinsic or participatory voice, be it epistemic, aesthetic, ethical, or otherwise.

In one of his last essays, Paul Shepard dismissed this perspective as suffocating and parochial.⁹ One way to signal their misrepresentation is through a little pun: the assumptions that underlie the supposedly neutral question about “how people *assign* meaning *to* the world” they can be unveiled by opposing its mirror formula, the question of “how people *receive* meaning *from* the world”. The former sounds more attractive to the ear of the Western intellectual, not because it is ultimately more convincing, but because it is rooted in the humanist-Cartesian tradition of subject-object separation that places human cognitive sovereignty above all else. However, there are powerful contemporary and pre-modern traditions which, contrary to the anthropocentric litany of “Meaning-Creating Man”, have seen meaning as already given *in* the world—and Human beings, like other animals, are capable of tuning in, capturing, deciphering, or directly receiving those meanings.¹⁰

Another way of developing this anti-constructivist position is that the representational structures with which people function *derive from* the world in which the human species evolved. The composition of language co-evolved along with, and with, the emanations and demands of the natural world—it is neither an alien creation nor a quantum leap into the beyond that nature managed to deliver thanks to the human brain.¹¹ It is not that we have been brought onto this planet from another dimension and must struggle to represent a confused world on our “terms.” Rather, general ideas and universal concerns about such things as truth, goodness, and beauty are an integral part of the natural universe within which they originate and upon which they are based when applied.

The difference between the alternatives boxed as “assign meaning” and “receive meaning” is also heuristically important in another sense. Anyone can assign meaning to nature, arbitrarily or for any purpose or motive. Not everyone is in a position to

⁹ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is ‘let’s save the planet we know,’ but that’s impossible right now.” (*The Earth Is Running Out*, page 31).

¹⁰ For example: “In that climate of opinion, it wasn’t long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.” (*Earth’s Revenge*, page 166).

¹¹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

receive meaning from the natural world with the same ease or insight. People receive meaning with varying degrees of depth and precision depending on whether they have relevant knowledge, adequate preparation, prior experience, appropriate awareness, passionate interest and attention, breadth of understanding, care, or sufficient self-training.

When vivisectors, for example, claimed that the movements and screeches of the animals they cut were mechanical reflexes, they were in fact assigning a self-serving register to nature—projecting a “virtual reality” that allowed them to go on with their work unreservedly. the inconvenience that a real registration would have entailed. However, when dealing with the ability of dogs to love, Charles Darwin pointed out that “everyone has heard the case of the dog that, while undergoing a vivisection, licked the researcher’s hand; that man, unless he had a heart of stone, must have felt remorse to the end of his days”¹². Darwin—for whom feeling, reason, intelligence, curiosity, wonder, aesthetics, and morality were evident in the animal world¹³—was neither “challenging” the vivisection view nor “negotiating” a “alternative narrative. He didn’t even bother to point out the misleading views of the vivisectors, but simply pointed out the pain where it was; then, almost casually, he made a comment about the bad conscience that *naturally* would have haunted the vivisector if he had been open to the information nature offered him.

The choice of anthropocentrically biased vocabularies—which interpret knowledge through work metaphors, political-legal deliberation, or meaning assignment—systematically erases the diversity of language games available to describe representational activities. Representations of nature can be, and indeed are, said to distort, fantasize, misinterpret, misrepresent, embellish, tentatively understand, approximate, serve whatever intents and purposes, intuit, predict, accurately explain, or profoundly discern. . Representations can also be variously described as interesting, beautiful, suggestive, questionable, objectionable, persuasive, compelling, or obvious.¹⁴ None of these affirmations about how representations and nature intersect is taken into account by postmodern constructivism, which, on the contrary, disregards the wealth

¹² Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

¹³ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

¹⁴ This sentence is incongruous. It should say “...it implies that everything we do is natural” or “it implies that nothing we do is supernatural”. It is probably a translation error, but since I do not have the original in English, I cannot be sure.

of epistemic evaluations with which language and common practices work (in science and in other realms) to favor a narrow and convoluted set of metaphors. The diversity of expressions is suffocated under the monolithic formula that says that knowledge is “socioculturally constructed”, as if the latter somehow illuminates more than the set of epistemic differentiations that it stifles.

Normal language includes a range of descriptions of how knowledge and beliefs are connected to the natural world: from misleading, biased, and self-indulgent, to tentative, good enough, or approximate, to deep, stable, precise, and even (! God forbid!) universally true. The concepts “knowledge” and “belief”, by themselves, express the epistemic status of phenomena with qualitatively different degrees of certainty¹⁵: but the difference between “knowing” and “believing” is either denied in constructivist thinking or else it is presented as a “contingent” under the veneer of representations. The blurring of the different representative modalities -to favor a one-dimensional vocabulary and in favor of human hegemony about knowledge as a sociocultural “construction” and/or as a “narrative”- is the omnipresent linguistic move on which the constructivist interpretation of nature rests. .

However, at the moment in which the multiplicity of linguistic games that capture the range of relationships between knowledge and nature is readmitted -more like a real map than as epiphenomena- we find ourselves liberated from the suffocating image of a solitary being who constructs representations projecting meanings either on a blank screen (strong constructivism) or on an elusive nature interpretable in different ways depending on the social position (epistemology of the point of view). This way of seeing things, as Shepard pointed out, is as oppressive as the positivism that it claims to refute.¹⁶ The two perspectives have more in common than they care to acknowledge: they share what David Ehrenfeld aptly called “the arrogance of humanism,” and what Vicki Hearne aptly called “humania.”¹⁷ In evaluating the art of connecting scientific knowledge and natural reality, both positivism and constructivism praise human representational and interventionist capacities as the linchpin. Neither school of thought has ever counseled its disciples on the importance of humility and respect for the natural world. This is no coincidence: these perspectives are what historian Lynn White

¹⁵ By “today”, I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁶ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): “*Like photosynthesizers*[*]< em>, we couldn’t have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn’t feel guilty about it” (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁷ Lovelock’s comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don’t own the original in English, I can’t say for sure that this is a translation problem.

has called “post-Christian”¹⁸, in the sense that for both the primary place meaning is found is in the *and* categories. *em* in human techniques—in biblical terms, name and work.

Constructivism’s hidden ties to the Judeo-Christian worldview reveal that the “social construction of nature” is a post-Christian point of view. The first similarity lies in the remarkable and familiar similarity between the constructivist assumption that nature is inherently voiceless and the Biblical myth in which Adam is charged with naming Creation. The second similarity involves the supposed special status of human beings: in biblical terms, Man was made in the image and likeness of God, while in constructivism humans, as beings possessing symbols and producing technology, stand apart from all others. animals. The third similarity between the Judeo-Christian and the constructivist perspectives is that for both the natural world is devoid of intrinsic meaning, being, order, mystery, value, or feeling. In fact, it was the Judeo-Christian worldview that deprived the natural world of its immanent meaning, desacralizing it and thus making it a place to be dominated and used, with virtually no restrictions, by human beings.¹⁹

The exorcism of the *soul* of nature -after two millennia of the dominant European Judeo-Christian material and religious culture- constitutes (already) an undetectable pillar of postmodern constructivism: the silencing of wild nature through long-term colonization term and through what the sociologist Max Weber called “the disenchantment with the world”²⁰ is found deep in the bowels of the amnesic paradigm that exalts human cultural “readings” and “practices” as the source of all knowledge.

The constructivist perspective has inherited, in a secularized way, key elements of what White called “the most anthropocentric religion in the world.” An important difference between the constructivist and Christian views is that the former acknowledges the diversity and fluidity of narratives, while the latter has often tried to impose a single doctrine. In any case, both are part of the same worldview: that the basis of the human relationship with nature has much more to do with the projection of meaning

¹⁸ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

¹⁹ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

²⁰ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It’s just that there are more of us and we have more resources.” (*The revenge of the Earth*, page 209).

and instrumental intervention, than with the cultivation of receptivity—open up, listen, observe, be within reach of, allow to be or merge with. Secular and religious (respectively), the story we are told is the same old “tail-wagging-dog” story, as deep ecologist George Sessions points out about postmodern anthropocentrism.²¹

The bottom line of the humanistic mindset—of which postmodern thought is the latest product—is that knowledge is a human grant from which we naturally develop a sense of cognitive supremacy over the rest of creation and/or of cognitive sovereignty over the world. According to the constructivist Andrew Ross, for example, “there are no ‘laws’ in nature, only in society, since ‘laws’ are made only by us and therefore can only be changed by us. Nature, in short, is not always the wisest.”²² Ecocentric sensibilities are repelled by such haughty parochialism: knowledge is a product of nature, not something that humans project onto or onto her; and knowledge is evident throughout the animal world, as naturalistic writings and writings on wild ecosystems²³, and increasingly also scientific texts, attest.²⁴

The constructivist assumption that the natural world lacks immanent meaning is neither patent nor uncontested. For cultures, individuals, and environmental movements that have adopted an ecocentric consciousness, nature is full of feeling—of love, joy, sorrow, curiosity, pain, wonder; nature is full of intelligence—awareness, attention, communication, reason, ingenuity; nature is full of energy perceived as aesthetic enthusiasm; nature is full of mystery experienced as a feeling of transcendence; and nature is full of spectacular order—complex, autopoietic, changing, temporally dynamic, and emergent. The contemptuous rejection of the natural world as having intrinsic meaning rests on the historical extermination of peoples who have regarded and treated plants, animals, and the earth as possessing an inherent intelligence in dialogue with human beings; and rests on the contemporary rejection of the latter, which is considered an atavism of the New Age.

When nature is understood as the source from which meaning and knowledge emanate -instead of as the object, the place of application or the epistemic result of cultural labors- what, for the most part, common sense intuits also follows logically: that there are ways of representing the world that are *essentially* deeper, truer, more penetrating, more enduring - not to say more respectable and beautiful - than others, not for socio-cultural or for reasons associated with the “knowledge/power” relationship, but because they side with nature in valid and insightful ways. Western science has created such knowledge in abundance, as have much older knowledge systems. Furthermore, not only intersubjective knowledge traditions, but also individuals, through self-education, can transform themselves into means of “personal knowledge” - the mind-heart-body, being itself a part of the world, can become in an appropriate instrument to understand and express nature.

²¹ “Red pine” in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

²² Page 114.

²³ “Wilderness” in the original. *N. of t.*

²⁴ “Chipmunks” in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

THE POLITICAL GROSSES OF CONSTRUCTIVISM

The constructivist project has been described as aiming to understand "the social history of nature"; this goal is contrary to, and enemy of, the goal of understanding "the natural history of society/humanity".¹ I have no interest in defending a *naturalistic* interpretation of human society against a *social* interpretation of nature. Rather, I will discuss the political implications of focusing on sociocultural interpretations of nature at this particular historical juncture.

Paying attention to the social history of nature, by omission, misses the end of natural history we are witnessing today: the accelerating and global breakdown of natural systems such as wetlands, river courses, forests, and forests. tropical, temperate and boreal zones, grasslands, deserts, tundra, coastal and oceanic habitats and their inherent biodiversity. This ecological destruction - whatever the level at which it is examined: habitat, ecosystem, species (as well as subspecies and variety), recent distribution of the organisms and migratory routes, population size, genetic diversity or evolutionary viability - is being documented and categorically denounced by scientists dedicated to evolutionary biology, ecology, the study of wildlife, botany and other disciplines. In fact, the new "conservation biology" -defined as a science at the service of conserving the diversity inherent to life- was created in the 1980s to oppose and mitigate the biodiversity crisis.²

At a time when unprecedented advances in the life and earth sciences invite a thoughtful openness to the scientific enterprise, humanities students are taught to deconstruct and translate natural science discourses into the languages of their own fields. The purpose is not to learn from science about the (state of) the natural world. On the contrary, the purpose is to arouse skepticism regarding taking scientific statements literally in order to understand the genesis of such statements as products of political negotiation, network action, ideological or ethical motivation, technological determination, or other variables depending on each case. case. From this perspective, the self-presentation of "scientific knowledge" is like the tip of the iceberg: What is not visible, but is revealed by constructivist analyses, is the submerged part that constitutes

¹ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

² "Sweat lodge" in the original. *N. from trans.*

the sociocultural pillars that scientists overlook or eliminate in formal presentations of facts, theories, or products.

By revealing the importance of social factors in science, and making scientists more aware of them, this project is intellectually and pragmatically valuable. However, it becomes incoherent when built on an iron-clad allegiance to skepticism about the realism of scientific claims—for the apparent purpose of either showing that the natural sciences are a branch of the human sciences, or leaving aside scientific claims as lacking special value, being "a set of interesting claims" among others. Questioning scientific and technological advances is desirable in order to avoid blind faith in the scientific world and cultivate a critical spirit; but constructivism goes beyond this welcome end and places scientific work under the siege of skepticism.³ But skepticism about the verifiability and (where applicable) universality of scientific knowledge is not at the service of the art of critical thinking: rather it clashes squarely with the voice of reason that says that a company dedicated to the search for the (universal) truth(s) about nature must, at least sometimes, hit the mark.[28]

The project of "the social history of nature" is not intrinsically at odds with what has been called the end of natural history, the end of nature, the holocaust of extinction, the death of births, the debacle biological or Biological Judgment Day.⁴ At the level of analysis, however, instead of focusing on the degradation of natural systems, constructivism focuses exclusively on human discourses about it.⁵ This way of addressing environmental issues is due to constructivist motives, which either put "nature itself" in parentheses as something foreign to social exegesis about it, or consider "natural reality" as an effect of representations rather than as a source of them.⁶ However, the epistemological interpretation of sociocultural contribution as a sufficient explanation of, or underlying constitutive force for, "natural reality" empowers human practices that reflect and reinforce our species' capacity for colossal arrogance; it generates the well-known logical and political problems associated with relativism⁷; and it reduces all fascination with the creation of knowledge to a story about *people*—rather than a revelation, conjecture, distortion, etc., regarding *nature*.

Taking seriously a human-caused end to natural history presupposes admitting the independent existence of what is ending; and it requires trust in the scientific discourses in charge of understanding the constituent elements and processes of natural history. It seems that insurmountable barriers to these prerequisites are set up in constructivist arguments—since they regard both scientific research and its consequent interpreta-

³ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also "tepee" or "teepee". *N. from trans.*

⁴ "DNR" in the original. "Department of Natural Resources". *N. from trans.*

⁵ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

⁶ "National forests" in the original. *N. from trans.*

⁷ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

tions of natural history as socioculturally negotiated and provisional configurations. But to assume that life on Earth is in trouble necessitates that the relevant biological knowledge be taken for what it really is—a very different attitude from deconstructing and/or setting aside its status as realistic representation or regarding its object as the result (rather than as the source) of the investigation. Taking science seriously means that instead of focusing exclusively on the metadiscourse about *how* scientific “claims” are made, there is a receptivity to the validity of biological findings; and that, instead of focusing on how scientific claims are “disproved” - a favorite topic of constructivists - attention is (also) paid to what scientists agree on.

Crucially to the argument presented here, life scientists agree that we are in the midst of a human-made biodiversity crisis.⁸ The seriousness of this diagnosis is not negated by the fact that scientific estimates of extinction rates often vary widely. The significant point is that biological science - conservation biology in particular - is a key source of knowledge about biodiversity losses, regardless of the obstacles to expressing them quantitatively and precisely.[34] The reality of this crisis is urgently documented by a growing biological literature; as EO Wilson puts it, “the evidence is convincing; there is a real problem and it deserves your serious attention.”⁹

However, constructivist analyzes of “nature” advocate remaining in the comfortable zone of dispassionate agnosticism and evasive metadiscourse. As David Kidner suggests, this intellectual stance may function as a mechanism that prevents dealing with the devastation of the biosphere - a stance that has been underway for some time but is gaining momentum with the looming quagmire created by triumphant consumerism and low population levels. never seen before. Human-caused extinction—according to Wilson’s rough estimate of 27,000 species a year—is so inconceivable that choosing to ignore it may well be the psychologically safest option. Be that as it may, this is the right moment in history for intellectuals from the humanities and social sciences to join forces with conservation scientists to help create the transformation in consciousness and changes in policy needed to stop this irreversible destruction. From this perspective, how human science students are taught to regard scientific knowledge, and what kinds of messages about the nature of scientific discoveries are filtered out to the public from intellectual circles, are hugely important. The “agnostic stance” of constructivism regarding “scientific statements” about the environment -a supposedly

⁸ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

⁹ “Wise-use movement” in the original. The “Wise Use” movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

obligatory attitude when it comes to discerning the way in which scientific knowledge is “socially constructed”[36,xiii]- consists, as it affirms a famous saying, in trying to interpret the world at a time when it is urgently asking us to change it.

A key idea that constructivism taps into is the fluidity of scientific knowledge—as Mick Smith says, “science changes; their opinions are not permanent”¹⁰. This way of seeing things, together with the fact that there are disagreements and vociferous (and sometimes highly politicized) debates within science, is cited as a striking indication that the image of science as “impartial, consensual and universally valid” is refuted by empirical studies of scientific research that show that science is changing, controversial, political, that it is influenced by values, weighed down by ideologies and mediated and technologically oriented, or that it depends on paradigms. While the constructivist project thus broadens the understanding of science and at first glance seems an acceptable substitute for a previously idealized view, upon closer examination we often see that it obscures the fact that invariant scientific data about the natural world are legion and continue to accumulate.[38] Constructivism tends to promote an image of science as ever-changing and controversial, trying to replace the idealization of consensus-based linear progress with an equally fictitious image of contending contingency.¹¹ In fact, “challenge”, “challenged” and “challenge”¹²¹³ are outstanding typical words of constructivism.

An example of invariable knowledge about nature, which has immeasurably broadened the horizons of humanity and is relevant to the case (of this article), has been the discovery of evolution. Although for a century and a half there have been acrimonious debates about the mechanisms and speed of speciation, it is equally true that, in 1859, Darwin opened a floodgate through which evidence confirming common ancestry has continued to flow. The various theories of evolution can be expected to gain or lose ground, but it would take a lot of stretching of the mind to imagine that *the gigantic fact* of evolution by modification from a common origin would one day be thrown into the bin of obsolete beliefs. After 150 years of supporting evidence from all branches of biological science, it appears that the evolutionary relatedness of life on Earth is here to stay as a universal fact.[40] To put it unequivocally, understanding evolution by modification from a common origin as a “universal fact about life” means that it remains true even for those who lived before Darwin’s discovery, and for those who currently live. they ignore it or oppose it; It can be considered true even for life in the universe in general, since even if life did appear on a planet, without a transmutation mechanism that allowed adaptation, it would be unlikely to survive in the long term the titanic forces of environmental change.

¹⁰ “Between villages there is a death zone” in the original. *N. from t.*

¹¹ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

¹² “Socially assembled” in the original. *N. from t.*

¹³ “„Contesting’, „contested’, and „contentious’” in the original. *N. from t.*

Another example of stable scientific knowledge can be shown, this time in relation to the understanding of ecosystems. It is well known that views about the stability and fluidity of ecosystems and about the relationship between biological diversity and ecological resilience¹⁴ have changed markedly over time; and they are likely to change again.¹⁵ But the general impression -together with innumerable concrete data- about what Darwin called "the tangled set" of organisms intertwined in the trophic pyramids, the relationships of symbiosis, tolerance and competition, the conversion of nutrients, the assimilation and decomposition of waste and the cycles of elements is so solid as to have become almost prosaic: it forms the *base* on which debates about the relative stability and dynamism of ecosystems are built. To focus on how perspectives within ecology have changed can be intellectually stimulating, but to obscure the underlying base of accumulated ecological knowledge relative to which scientific analysis has changed is to miss out on an enormous portion of the spectrum that constitutes "scientific knowledge." "

Closely linked to established knowledge about evolutionary and ecological processes are a great deal of recent conservation biology research on: the consequences for ecosystems and their biodiversity of habitat destruction and fragmentation; the surface requirements for each species, especially so that populations of predators and other key species¹⁶ are viable; the impact of invasive species; the connection between genetic variability and evolutionary viability; recognition of the widespread decline in the biological integrity of ecosystems; estimates of population thresholds below which species and subspecies enter the danger zone of potential annihilation; and how the effects of climate change worsen the biodiversity crisis.[42] These scientific discoveries, among many others, inform the state of the biosphere: they reveal that without necessary changes in human activities, fundamental aspects of natural history—namely, evolutionary processes, ecological integrity, healthy populations of living beings non-humans and biodiversity - will continue to be dismantled.

Focusing epistemologically on the "social history *of* nature", at a time when the catastrophic impact of "social history *in* nature" is increasing, may be reasonably considered as a diversion of intellectual and political energies to matters unrelated to the main event.

A more severe criticism of the constructivist approach to nature is that it not only diverts attention away from the environmental problem, but also maintains that problem. Constructivists consider radical ecological views to be "a product of current

¹⁴ Resilience is the ability of a complex system or process to absorb disturbances and maintain a state of dynamic equilibrium or homeostasis. *N. from t.*

¹⁵ 1 mile is approximately 1.6 km. *N. from t.*

¹⁶ "Keystone species" in the original. In conservation biology, this term refers to *low abundance* species whose role in the ecosystem is fundamental, since they affect the quantity and diversity of many other species and, despite their low abundance, They have a very large effect on their environment. They are, therefore, essential elements of the ecosystem, which will be seriously altered if these key species disappear. *N. from t.*

social circumstances”¹⁷ - a charge to which radical environmentalists themselves plead guilty in trying to redress those circumstances. However, social constructivism is also “a product of current social circumstances” - although it has very little to do with a protest: the most disturbing facet of the constructivist paradigm is that it is an attempt to understand nature that is driven by (and in that sense takes advantage of) the social destruction of nature.

In his lukewarm critique of constructivism, Peterson makes the observation that nature can be viewed as “socially constructed” in two ways, ideal and material: ideas about nature are shaped through various cultural lenses; and natural landscapes are physically altered by technologies and human activities.[44] Peterson sees both as different facets of the “social construction of nature.” What others have added to this analysis is that the two are mutually reinforcing, especially at this point in history.¹⁸

The idea that the Earth’s natural systems are only understandable in “mediatized” terms unfortunately sounds very much like a global attempt to turn the planet into a colony of *Homo sapiens*: if nature is flexible enough to be shaped by human labor, then it can be considered passive enough to be entirely constituted by cultural discourses; and as nature is increasingly simplified by human forays, it not only appears, but *becomes* more susceptible to conceptual subordination. These are the tacit coincidences between the social destruction and the social construction of the natural systems of the planet and, thus, an order of things that could well be branded perverse is, instead, implicitly exploited by constructivism to reinforce its epistemology.

As human impact on the planet increases, the autonomous self-organization of the natural world is consequently destroyed, and along with this destruction, the idea that there is no “essential nature” beyond cultural mediations is solidly realistic. . As the biosphere is colonized—occupied, paved over, dug up, burned, dammed, drained, over-exploited, looted, and heavily used—different conceptions of how “nature” and “society” relate (or should relate) are increasingly more easily devastated by the monolithic image of the “nature-society” hybridization. The idea that “we have moved from thinking of nature and society as distinct realms or regions to thinking of them as intertwined or inextricable”¹⁹ is typically justified by images of a domesticated, impoverished, or technologically reconstructed world.

Thus, Steve Hinchliffe offers an illustrative pictorial example – skeptically titled “Nature Parks?” – showing only a partial view of Snowdonia National Park²⁰, with

¹⁷ In this regard, see also the presentation of “There where man is a visitor” by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

¹⁸ “Wilderness” in the original. This term refers to lands and ecosystems that are little or not at all humanized. Depending on the context, it can be translated in various ways: “wild lands”, “wild territories”, “wild areas”, “wild ecosystems” or, more generally, “wild nature”. In this text it has been translated as “wild nature” except in cases where it is explicitly indicated otherwise. *N. of t.*

¹⁹ “Wilderness” in the original. *N. of t.*

²⁰ National park located in Great Britain. *T.N.*

pastures and fences in the foreground, noting that “this scene is both social and natural. Along with a hypothetical example of cloning (in which he similarly tells us that both biology and society would contribute to the identity of a cloned person). He apparently hopes that “these examples may have convinced you that nature and society are in fact two sides of the same coin.”²¹ In fact, they are, when it comes to what advocate of wild ecosystems²² Bob Marshall calls “the tyrannical ambition of civilization to conquer each and every niche on Earth”, ambition which is either allowed to carry on unperturbed or implicitly excused as an acceptable course of history.²³

Strongly relying on the theses expressed by Latour in *We have Never been Modern*, Hinchliffe criticizes the separation between nature and society as “pure” categories²⁴. However, the hybrid (constructivist) model of a mixture between nature and society and the purist (objectivist) model of a separate nature and society share the *totalizing design* characteristic of all ideological and/or overtheorized formulation: we are invited to take the bait by choosing between the two. From an ecologically informed environmentalist perspective, both models are flawed; both are “debugs”—prefabricated academic kits with precooked semantics and concepts that spare students the effort of creating their own instruments.²⁵

The alternative is to take the generally assumed broad categories of “nature” and “society” for what they are, referring to a series of empirical phenomena and conditions. The character of their relationship is not decided *a priori* by ambitious theoretical schemes, but rather is defined and understood in different ways depending on what corresponds in each case—in contexts of analysis, assessment and action. concrete. It is under these terms that the defenders of wild ecosystems²⁶ defend areas “in which the land [*sic*] and its community of life are free from man-imposed fetters, where the Man himself is a visitor who does not remain.”²⁷ Whatever the weaknesses of this definition, the intention of those who thus crystallized the understanding of the wild forty years ago *is to establish a key point for resistance* against both the creation of a humanized and biologically degraded planet. as against his epistemological servant that everything

²¹ “Wildness” in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply “wild nature”. Here, except where otherwise noted, it has been translated as “the wild character.” *N. of t.*

²² “Wilderness” in the original. *T.N.*

²³ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

²⁴ “Wilderness” in the original. *N. of t.*

²⁵ “Rambunctious garden” in the original. It is an allusion to *Rambunctious Garden* which, as the author points out below, is the title of a book by Marris in which he defends the domestication and management of the Biosphere. *N. of t.*

²⁶ Ditto. *N. from t.*

²⁷ “Breakthrough Institute” in the original. *N. of t.*

is a “hybrid” hodgepodge, a “cyborg” jumble and a hodgepodge between “nature and society”.

THE THREATENED IDEA OF THE WILD AND THE REALITY OF THE WILD

There is nothing innocent, either intellectually or socially, in the declaration that "wildness" is a cultural concept comes out precisely now: while wild nature is sinking into the morass of all kinds of developments, the idea of it begins to be perceived as something ethereal. What pretends to be a sophisticated argument -that the wild is an invention because it has been a (non-)idea that varies according to different historical conceptions- in a socio-historical context can be understood as the expected ideological echo of the appropriation of nature. wild nature.

In his work *Grizzly Years*, Doug Peacock already observed that the wild was becoming a threatened idea long before questioning its essence became fashionable among intellectuals. "After Vietnam I saw that the world was changing with astonishing rapidity, at a violent rate that I had not noticed before 1968. The beat that I had heard as a slow drumbeat in the fifties was now a fast *staccato*... Everywhere you looked you saw a small-scale replica of what was frantically happening all over the world—even in the woods, in grizzly bear country. *The very concept of the wild ecosystem¹ as a place beyond the restrictions of culture and human society was in danger*".² Already in the late 1960s, Peacock felt that the desecration of the wild paved the way for its conceptual annihilation.

The increasingly narrow siege suffered by wild nature is an appropriate existential environment for the idea that the wild is a social construction. Because of this tight historical coincidence, the constructivist idea of wilderness functions as an ideology - regardless of whether it is sought after or not. "Wildness" as an invention conceptually

¹ Idem. *N. from t.*

² "Think tank" in the original. Think tanks are usually organizations made up of multidisciplinary theorists and intellectuals who express their opinions on[https://es.wikipedia.org/wiki/Pol%c3%adtica_social][social policy,][https://es.wikipedia.org/wiki/Estrategia_pol%c3%adtica][political strategy,][<https://es.wikipedia.org/wiki/Econom%c3%ada>][economic]o[<https://es.wikipedia.org/wiki/Militar>][military,][<https://es.wikipedia.org/wiki/Tecnolog%c3%ada>][technology]o[<https://es.wikipedia.org/wiki/Cultura>][culture .]They are characterized by having some kind of ideological [https://es.wikipedia.org/wiki/Ideol%c3%b3gica][n] orientation and are often related to military laboratories, private companies and academic or research institutions. another type. His works usually have an important weight in politics and public opinion, particularly in the United States. *N. from t.*

blurs objective reality in references to the world, consequently strengthening the physical eradication of the world by the very civilization that has spawned constructivist thinking. As Soulé puts it, the attack on nature has unfolded: the overt physical attack and the “covert [theoretical] assault [which] serves to justify, when useful, the physical attack.”³ Similarly, Kidner claims that constructivism “provides a model of nature that constantly conforms to the industrialist worldview.”⁴

The argumentative strategy of the social construction of nature runs in line with what Vandana Shiva has called “the politics of disappearance.”⁵ The main tactic is to hide from view that the meaning of a concept is not only made up of its *meaning* but also of its *reference*. What the wild refers to is systematically left out of the discussion since constructivist analyses remain at the level of the (culturally and historically divergent) ideas of the people, as if the beliefs and feelings about the wild completely exhaust the concept meaning. Borrowing a rather hackneyed example from linguistics, it is as if analysts documented the divergent beliefs of two tribes about the “morning star” and the “evening star” and, discovering that the narratives about these “stars” differ profoundly, the analysts concluded that they either cannot refer to the same celestial body⁶ or else they do not refer to anything (really knowable) beyond the discourses about the “stars.”⁷

By disregarding the reference dimension of the wild, constructivist thought completely dilutes its meaning in the abstract.⁸ The meaning of the wild, of course, is not only its referent(s): but as the incursion into virtually all terrestrial and oceanic habitats progresses, this ancient facet of the concept of the wild—which has held its various cultural meanings together - is being torn apart just as surely as its physical counterpart. By treating “the wild” as an abstract idea, constructivists are both reflecting and acquiescing in the disappearance of its reality.

Another tactic of the politics of disappearance is that while the reference to wild ecosystems⁹ as self-organized and self-determined non-human habitats is fully admit-

³ “Wilderness” in the original. *N. of t.*

⁴ “Untrammelled by man” in the original. It refers to a famous and controversial section of the US Wilderness Act (section 2c). *N. from t.*

⁵ Secondary growth forests, or secondary forests, are forests that have grown again after being felled and that, after a sufficiently long period, are in the process of recovering, so that the effects of felling cease to be appreciable. Secondary forests are different from forests that regrow after natural disturbance (early serial forests), such as fire, pests, wind, etc. since they largely lack the nutrients, as well as the protection against erosion or the capacity to retain water in the soil that dead trees provide. *N. from t.*

⁶ Both the so-called “morning star” and the “evening star” are the same celestial body, the planet Venus, observed with the naked eye at the two times of day when it stands out for its brightness. *N. from t.*

⁷ “America’s federally designated wilderness system” in the original. *N. of t.*

⁸ There is a partial Spanish translation of “A Sandy County Almanac” in *An Earth Ethic*. Waterfall Books, 2005.

⁹ “Wilderness” in the original. *N. del.t.*

ted, they are denied any existential/ontological character.¹⁰ The denial of essentialism is fostered by presenting ecological knowledge as permanently controversial and tentative and, more generally, by undermining the credibility of biological science as the ultimate authority when it comes to talking about natural systems. Constructivist literature is also replete with passing references to the supposedly obvious—that there is no essential core to “the wild” beyond the play of culturally diverse narratives or socially negotiated constructions. The anti-essentialism of postmodern constructivism is presented as the height of the intellectual elite. The essentialist notion of the wild is dismissed as an anachronism advocated by naive romantics—or by those uninitiated in the abstruse musings of postmodern enlightenment.

The wild as an essential reality independent of human presence, will, and control is likewise rejected as “one of the poles of a dualism” that reflects the reified separation between virgin nature and impure humanity.¹¹ Critics of the idea of wilderness¹² speak a great deal about the historical roots of the notion of the wilderness as a virgin realm untouched by people, and the apparent chimera that this entails. In fact, such analyzes consider the separation of humans from wild nature to be *the driving force* behind environmental destruction: for example, the conquest of the New World was carried out from of such a disconnected mentality. This argument is solid to the extent that it evokes an idea of “separation” from the wild that refers to the attitudes and actions of human beings separated from wild nature, who believe they are superior to it and, therefore, therefore, with the right to use it indiscriminately.

However, if one looks at the colonizing *modus operandi* from a different angle, the problem is equally well defined if it is understood as an *insufficient perception* of the proper dimensions of separation. between humans and wild habitats. Conquerors have always tried to annex both wilderness and people by violating legitimate boundaries—first annihilating and then assimilating others, human or otherwise. So, while much is said about the supposed problem of the separation of human beings from wild nature¹³ -or of “society” from “nature”-, little attention is paid to the good part of such separation. In a world where all are revered, a respectful observance of separation is equally revered as a complement to intimacy with nature, not as its negation. This meaning of separation does not come from an ideology of dualism between the human and the wild, but from the cultivation of ecological ethics as understood by Aldo

¹⁰ Literally “Dust Bowl”, “Dust Bowl” is the name by which the phenomenon is known in English that in the 1930s affected the plains and prairies that stretch from the Gulf of Mexico to Canada. The soil, stripped of moisture, was blown up by the wind in great clouds of dust. The drought-resistant grasses of the original prairie ecosystem were replaced by wheat crops that, failing due to drought, left the soil bare, creating dust storms of unprecedented magnitude. *N. from t.*

¹¹ There is a Spanish translation of “Thinking like a mountain” in *An Ethics of the Earth*. Cataract Books, 2005. *N. from t.*

¹² *Idem. N. from t.*

¹³ *Idem. N. from t.*

Leopold: a self-imposed limitation of our actions that arises from love, respect and admiration. by land.¹⁴

It is in this spirit that radical environmentalists argue that wilderness¹⁵] is an essential reality largely independent of human presence and control: Earth's wilderness^{xxxvi} are the homeland of nonhumans—in scientific terms, they are reservoirs of biodiversity in which native life can thrive and evolve.[61] Without the wide range of conditions that wild nature presents¹⁶, we face the daunting prospect of a human-initiated biogeological era characterized by a natural history devoid of wild animals, plants, and ecosystems. Life will go on, of course, but *the flame of life* - fanned by the breath of evolutionary emergence, of immeasurable ecological complexity, of an abundance of living beings, and of a diversity of living forms whose exact order of magnitude is still unknown - it is in serious danger of going out.

CONCLUSION

What Max Weber called the “disenchantment with the world” of modern civilization—what critical theorists Max Horkheimer and Theodore Adorno bitterly interpreted as that “dry wisdom that there is nothing new under the sun”¹⁷—was it is materializing in a prosaic and homogenized reality that everywhere bears (or, if things continue like this, will bear) the human stamp.

Alongside this emerging new order of reality, the memory (or future possibility) of a time when the natural world emanated an essence that was densely fragrant, incredibly fresh, abundant, seemingly indomitable, diverse, largely unknown, filled charm and wildness is fast disappearing from the human psyche. Towards the end of the 19th century, the British poet Gerard Manley Hopkins looked through the metamorphosis of the world at the hands of man with penetrating words:

*Generations have passed, have passed, have passed;
and everything is scorched by trade; exhausted, marked by the effort;
and bears the stain of man and shares the smell of man: the ground is bare now, the
foot cannot feel when shod.*¹⁸¹⁹

After a century since these lines were written, it is becoming more and more unlikely that we can rest easy with the sentiment, which the poet later expressed in his sonnet, that “For all this... lives the dearest freshness there.”, at the bottom of things”.^{xxix} In fact, the longing for such freshness is increasingly being considered as something

¹⁴ “Wildness” in the original. *N. from t.*

¹⁵ *Idem. N. from t.*

¹⁶ “Wilderness” in the original. *N. from t.*

¹⁷ Norse. *N. from t.*

¹⁸ “Generations have trod, have trod, have trod; / And all is seared with trade; bleared, smeared with toil; / And wears man’s smudge and shares man’s smell: the soil / Is bare now, nor can foot feel, being shod.” in the original. *N of the t.*

¹⁹ “For all this. There lives the dearest freshness deep down things” in the original. . *N. from t.*

embarrassing – branded as romantic, atavistic and unrealistic. The derogatory power of such labels reflects the strength of a socioeconomic system in which, as Herbert Marcuse pointedly pointed out, “not only radical protest, but even the attempt to formulate, to articulate, to give voice to protest assumes a puerile immaturity and ridiculous.”²⁰

If the resistance against the culmination of a colonized planet is to have any hope of success, we should be exceptionally belligerent towards the postmodern call to cast aside childlike concepts like “purity,” “essence,” and “the romantic idea of wildness.”

Grades:

1. See Steve Hinchliffe and Kath Woodward, *The Natural and the Social: Uncertainty, Risk, Change* (London: Routledge, 2000); Arturo Escobar, “After Nature: Steps to an Anti-Essentialist Political Ecology,” *Current Anthropology* 40, no. 1(1999); 1-6; Phil Macnaghten and John Urry, *Contested Natures* (London: Sage, 1998); Jozef Keulartz *The Struggle for Nature: A Critique of Radical Ecology* (London: Routledge, 1998); Sheila Jasanoff and Brian Wynne, “Science and Decisionmaking,” in Rayner and Malone, eds., *Human Choice and Climate Change* (Columbus, Ohio: Battelle, 1998); Philippe Descola and Gisli Palsson, *Nature and Society: Anthropological Perspectives* (London: Routledge, 1996); William Chronon, ed., *Uncommon Ground. Towards Reinventing Nature* (New York: WW Norton, 1995); Andrew Ross, *The Chicago Gangster Theory of Life: Nature’s Debt to Society* (London: Verso, 1994).

2. Macnaghten and Urry, *Contested Natures*, p. 95.

3. Jean-François Lyotard, *The postmodern Condition: A Report on Knowledge* (Minneapolis: University of Minnesota Press, 1989); Ian Hacking, *The Social Construction of What?* (Cambridge: Harvard University Press, 1999); Michael Lynch, “Towards a Constructivist genealogy of Social Constructivism”, in Irving Velody and Robin Williams, eds., *The Politics of Constructionism* (London: Sage Publications, 1998); André Koukla, *Social Constructivism and the Philosophy of Science* (London: Routledge, 2000); David Demeritt, “What is the ‘Social Construction of Nature’? A Typology and Sympathetic Critique”, in *Progress in Human Geography* 26, no. 6 (2002): 767-90.

4. George Sessions, “Postmodernism and Environmental Justice,” *The Trumpeter* 12, no. 3 (1995): 150-54; David Kidner, “Fabricating Nature: A Critique of the Social Construction of Nature,” *Environmental Ethics* 22 (1999); 339-57.

5. Michael Soulé and Gary Lease, eds., *Reinventing Nature? Responses to Postmodern Deconstruction* (Washington, DC: Island Press, 1995), p. xvi. Gary Snyder, “Is Nature Real?” in Tom Buttler, ed., *Wild Earth: Wild Ideas for a World out of Balance* (Minneapolis, Minnesota: Milkweed Editions, 2002).

6. Hannigan, *Environmental Sociology*, p. 33.

²⁰ “Self-willed” in the original. *N. from t.*

7. Anna Peterson, "Environmental Ethics and the Social Construction of Ethics," *Environmental Ethics* 21 (1999): 339-57: p 341.
8. Demeritt, "What is the „Social Construction of Nature’?" p. 775. c
9. Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," in Mario Biagoli, ed., *The Science Studies Reader* (New York: Routledge, 1999).
10. Paul Shepard, "Virtually Hunting in the Forests of Simulacra," in Solulé and Lease, *Reinventing Nature?* pp. 17-29.
11. Defenders of wild ecosystems²¹, deep ecologists, naturalists, poets, farmers living close to the land, scientists and phenomenologists have, in various ways, expressed their opposition to the notion of a passive natural world to which the human *cogito*²² gives meaning.
12. Cff. Gary Snyder, *The Practice of the Wild* (New York: North Point Press, 1990).
13. Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (1871; reprint edition, Princeton: Princeton University Press, 1981), p. 40.²³
14. Charles Darwin, *The Descent of Man and Selection in Relation to Sex; On the Expression of Emotions in Man and Animals* (1872; reprint edition, Chicago: University of Chicago Press, 1964)²⁴; *On the Formation of Vegetable Mold by Worms with Observations on their Habits* (1881; reprint edition, Chicago: The University of Chicago Press, 1985)²⁵.
15. EO Wilson, *Consilience: The Unity of Knowledge* (New York: Vintage Books, 1999) p. 64.²⁶
16. Jeff Coulter, *Mind in Action* (Oxford: Polity Press, 1989).
17. Shepard, "Virtually Hunting Reality," p. twenty.
18. David Ehrenfeld, *The Arrogance of Humanism* (New York: Oxford University Press, 1978); Vicki Hearne, *Adam's Task: Calling Animals by Name* (New York: Vintage Books, 1987).
19. Lynn White, Jr., "The Historical Roots of Our Ecological Crisis," *Science* 155 (1967): 1203-07.²⁷

²¹ "Wilderness advocates" in the original. *N. from t.*

²² "*Cogito*" is a Latin term meaning "to think". *N. from t.*

²³ There are editions in Spanish. For example: *The origin of man*, Edimat, 2006. *N. from t.*

²⁴ There are Spanish editions of *On the Expression of Emotions in Man and Animals*, as a separate text. For example: *The expression of emotions in animals and in man*, Alianza Editorial, 1998. *N. from t.*

²⁵ There is an edition in Spanish: *The formation of vegetable litter by the action of earthworms, with observations on their habits*, Catarata, 2011. *N. from t.*

²⁶ There is an edition in Spanish: *Consilience: the unit of knowledge*. Circle of Readers, 1999. *N. from t.*

²⁷ There is a Spanish translation: "Historical roots of our ecological crisis", *Revista Ambiente y Desarrollo* 23, n°1: 78-86. *N. from t.*

20. White, "The Historical Roots of Our Ecologic Crisis"; Roderick Nash, *Wilderness and the American Mind* (New Haven: Yale University Press, 1967); Carolyn Merchant, *The Death of Nature* (San Francisco: Harper San Francisco, 1983). For more ecocentric interpretations of Christianity, see Holmes Rolston, III, "Wildlife and Wildlands: A Christian Perspective," in Dieter Hessel, ed., *After Nature's Revolt: Eco-justice and Theology* (Minneapolis: Fortress Press, 1992). White himself ended his now classic writing by proposing Francis of Assisi as the patron saint of environmentalists.

21. Max Weber. "Science as a Vocation," in Gerth and Mills, eds., *From Max Weber: Essays in Sociology* (1919, reprint edition, New York: Oxford University Press, 1946), p. 155.

22. George Sessions, "Postmodernism and Environmental Justice," p. 153.

23. Ross, *The Chicago Gangster Theory of Life*, p. fifteen.

24. Donad Griffin, *Animal Minds* (Chicago: University of Chicago Press, 2001).

25. Mick Smith, "To Speak of Trees: Social Constructivism, Environmental Values, and the Future of Deep Ecology," *Environmental Ethics* 21 (1999): 359-76.

26. Michael Soulé, "What is Conservation Biology?," *BioScience* 35 (1985): 727-34; Reed Noss, "Is There a Special Conservation Biology?" *Ecography* 22 (1999): 113-22.

27. Skepticism has crept into constructivism through the appeal to assume two philosophical theses as openly (and ironically) true: "the underdetermination thesis"²⁸ [(all theories are underdetermined by the facts) and "the thesis of the theoretical load of observation"²⁹ (data are always influenced by interpretation, techniques, paradigms, etc.). Hacking, *Social Construction of What?*, p. 73.

28. For philosophical accounts of the incoherence of skepticism, see Jeff Coulter's latest discussions, influenced by Wittgenstein's ideas, *Mind in Action*; Stanley Cavell, *Disowning Knowledge: In Six Plays of Shakespeare* (Cambridge: Cambridge University Press, 1987); and Hearne, *Adam's Task*.

29. The fact that recent scientific literature often characterizes the decimation of plants, animals and ecosystems by humans in such value-laden terms reflects the se-

²⁸ "Underdetermination thesis" in the original. In philosophy of science, the theory underdeterminacy argument asserts that for any collection of facts, there is more than one theory that explains them; then the facts are unable to determine which is the true theory. They only allow ruling out among some possible alternatives, but without ever reaching a single possibility. The consequence that some relativists draw from this is that then we do not have any rational procedure to be able to decide, among alternative theories, which is the best. Other non-relativistic philosophers consider that it is possible to rationally discriminate between various alternative theories, and underdetermined by the facts, through other epistemological criteria, such as simplicity in explanation, compatibility with other theories, etc. *N. from t.*

²⁹ "Theory-ladenness of observation" in the original. The thesis of the theoretical load of observation maintains that everything that is observed is interpreted through the prior understanding of some theories and concepts. Whenever we describe observations, we consistently use the terms and measures that our society has adopted. Therefore, according to this argument, it would be impossible to understand those observations for anyone who does not know, or do not share, the theories and culture from which those terms are derived. *N. from t.*

riousness of the biodiversity crisis. For constructivists, expressions such as "holocaust" or "Armageddon" would be constructed as "rhetoric of calamity" (Hannigan, *Environmental Sociology*, p. 36) or as an ecological "morality game" (Ross, *Chicago Gangster Theory of Life*, p. 31). Such a constructivist point of view insists on blindly keeping its attention focused on the words, instead of looking at the facts that lead scientists and other people to use them.

30. Constructivists express skepticism even about the diagnosis that we are in the midst of "an environmental crisis." For example, Hannigan, *Environmental Sociology*, p. 30.

31. Bruno Latour and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts* (Princeton: Princeton University Press, 1986).³⁰

32. See James Proctor, "The Social Construction of Nature: Relativist Accusations, Pragmatist and Critical Realist Responses," *Annals Of the Association of American Geographers* 8 (1998): 352-76.

33. EO Wilson, *The Future of Life* (New York: Alfred Knopf, 2002)[xl]; John Terborgh, *Requiem for Nature* (Washington DC: Island Press, 1999); Paul Erlich, "Extinction: What is Happening Now and What Needs to be Done," in David K. Elliot, ed., *Dynamics of Extinction* (New York: John Wiley, 1986), pp. 157-64; Peter Raven, "Disappearing Species: A Global tragedy", *The Futurist*, October 1985, pp. 9-14; "What Have We Lost, What Are We Losing?" in Michael J. Novacek, ed., *The Biodiversity Crisis: Losing What Counts*, American Museum of Natural History book (New York: New Press, 2001); Stuart Pimm, "Can We Defy Nature's End?" *Science* 293 (2001): 2207-08.

34. W. Wayt Gibbs, "On the Termination of Species", *Scientific American*, November 2001, pp. 40-49[xli]; Eileen Crist, "Quantifying the Biodiversity Crisis," *Wild Earth* 12, no. 1 (Spring 2002): 16-19.

35. EO Wilson, "Introduction" in Susan Middleton and David Liittschwager *Witness: Endangered Species of America* (San Francisco: Chronicle Books, 1994), p. 17.

36. Hannigan, *Environmental Sociology*, p. 31.

37. Smith, "To Speak of Trees," p. 370.

38. Holmes Rolston, III, "Nature for Real: Is Nature a Social Construct?" in TDJ Chappell, ed., *The Philosophy of the Environment* (Edinburgh: University of Edinburgh Press, 1997), pp. 38-64; Hacking, *The Social Construction of What?*

39. Criticizing radical ecologists for relying on scientific ecology, Keulartz argues that "as the empirical and experimental science that it is...[its] results are by definition controversial and tentative, so ecology as such has a fallible rather than fundamentalist character. Keulartz's strange view of ecological science as "always uncertain" is inspired by the postmodern perspectives of Latour, Haraway, Derrida, and others (Keulartz, *Struggle for Nature*, pp. 155, 2, 158).

³⁰ There is an edition in Spanish: *Life in the laboratory: the construction of scientific facts*, Alianza Editorial, 1995. *N. from t.*

40. Ernst Mayr, *The Growth of Biological Thought: Diversity, Evolution, and Inheritance* (Cambridge: Belknap Press, 1982); *One Long Argument: Charles Darwin and the Genesis of Modern Evolutionary Thought* (Cambridge: Harvard University Press, 1991)[xlii].

41. Daniel Goodman, "The Theory of Diversity-Stability Relationships in Ecology," *Quarterly Review of Biology* 50 (1975): 237-66; Daniel Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (New York: Oxford University Press, 1990); Donald Worster, "The Shaky Ground of Sustainability," in George Sessions, ed., *Deep Ecology for the Twenty-first Century* (Boston, Mass.: Shambhala Press, 1995).

42. Stuart Pimm and Peter Raven, "Extinction by Numbers," *Nature* 403 (2000), pp.843-45; John Terborgh, "The Big Things that Run the World - A Sequel to EO Wilson," *Conservation Biology* 2 (1988): 402-03; Reed Noss *et al.*, "Conservation Biology and Carnivore Conservation", *Conservation Biology* 10 (1996): 949-63; Greta Nilsson, *The Endangered Species Handbook* (Washington DC: Animal Welfare Institute, 1983); Gary Meffe and Ronald Carroll, "Genetics: Conservation of Diversity within Species," in Gary Meffe and Ronald Carroll, eds., *Principles of Conservation Biology* (Sunderland, Mass.: Sinauer Associates, Second Edition, 1997), pp.161-201; David Pimentel, Laura Westra, and Reed Noss, eds., *Ecological Integrity: Integrating Environment, Conservation, and Health* (Washington, DC: Island Press, 2000); Michael Soulé, ed., *Viable Populations for Conservation* (Cambridge: Cambridge University Press, 1987); Robert Peters and Thomas Lovejoy, eds., *Global Warming and Biological Diversity* (New Haven: Yale University, 1992); Stephen Schneider and Terry Root, "Impacts of Climate Changes on Biological Resources," in Michael J. Mac *et al.*, eds., *Status and Trends of the Nations Biological Resources* (Washington, DC: US Department of the Interior, US Geological Survey, 1998), vol. 1, p. 89-116; Reed Noss, "Beyond Kyoto: Forest Management in a Time of Rapid Climate Change," *Conservation Biology* 15 (2001): 578-90.

43. Smith, "To Speak of Trees," p. 365.

44. Peterson, "Environmental Ethics and the Social Construction of Ethics"; De-meritt, "What is the 'Social Construction of Nature'?", pp. 778-79.

45. Soulé, "The Social Siege of Nature," in Soulé and Lease, *Reinventing Nature?*, pp. 137-70; Kidner, "Fabricating Nature."

46. Hinchliffe and Woodward, *The Natural and the Social*, p. 155.

47. *Ibid.*, p. 3.

48. Robert Marshall, "The Problem of the Wilderness," in Callicott and Nelson, eds., *The Great New Wilderness Debate* (Athens: University of Georgia Press, 1998), pp. 55-96.

49. Bruno Latour, *We have Never been Modern* (Cambridge: Harvard University Press, 1994).[xliii]

50. In his "Cyborg Manifesto," in Simon During, ed., *The Cultural Studies Reader* (London and New York: Routledge, 1999), pp. 271-91, Haraway takes issue with the "to-

talizing tendencies of Western identity theories” (p. 279)—and then goes on to propose an equally stifling theory in the form of a “cyborg ontology” (p. 272).

51. “Wilderness Act of 1964,” in Callicott and Nelson, *Great New Wilderness Debate*, p. 121.

52. Dough Peacock, *Grizzly Years: In Search of the American Wilderness* (New York: Henry Holt, 1990), p. 65 (emphasis added).[xliv]

53. Soulé, “The Social Siege of Nature,” p. 137.

54. Kidner, “Fabricating Nature,” p. 352.

55. Vandana Shiva, “Monocultures of the Mind,” *The Trumpeter* 10 (1993): 132-35.

56. Rolston makes a similar point when he says that constructivist analyzes of the wild combine the epistemological and ontological dimensions of the concept. “Nature for Real”, p. 54.

57. See Jack Turner, *The Abstract Wild* (Tucson: University of Arizona Press, 1996), ch. two.

58. When examining “the production of spaces in nature”, Macnaghten and Urry include “wilderness ecosystems”[xlv] in the same bag as “zoos, Disney World, nuclear power plants, shopping centers and military areas” (Macnaghten and Urry, *Contested Natures*, p. 173).

59. J. Baird Callicott, “the Wilderness Idea Revisited: The Sustainable Development Alternative,” in Callicott and Nelson, *Great New Wilderness Debate*, pp. 337-66. See also Cronon, “The Trouble with Wilderness.”

60. Aldo Leopold, “The Land Ethic,” in *The Sand County Almanac* (Oxford: Oxford University Press, 1949), pp. 201-26.[xlvi]

61. See Tom Butler, ed., *Wild Earth: Wild Ideas for a World out of Balance* (Minneapolis, Minnesota: Milkweed Editions, 2002); Michael Soulé and Reed Noss, “Rewilding and Biodiversity: Complementary Goals for Continental Conservation,” *Wild Earth* 8, no. 3 (1998): 18-28; Dave Foreman, “Wilderness

[xliii] There is an edition in Spanish: *We have never been modern*, Debate, 1993. *N. from t.*

[xliv] There is an edition in Spanish: *My grizzly years: in search of wild nature*, Errata naturae, 2015. *N. from t.*

[xlv] “Wilderness” in the original. *N. from t.*

[xlvi] There is an edition in Spanish: *An Ethics of the Earth*, Catarata, 2005. *N. from t.*

Areas for Real”, in Callicott and Nelson, *Great New Wilderness Debate*, pp. 395-407; Holmes Rolston, III, “The Wilderness Idea Reaffirmed”, in Callicott and Nelson, *Great New Wilderness Debate*, pp. 367-86.

62. Max Horkheimer and Theodore Adorno, *Dialectic of Enlightenment* (New York: Continuum, 1969), p. 12.xlvii

63. Herbert Marcuse, *Eros and Civilization* (Boston: Beacon Press, 1966), p. xxi.[xlviii]

[xlvi] There is an edition in Spanish: *Dialectica de la Enlightenment*, Akal, 2007. *N. from t.*

[xlviii] There is an edition in Spanish: *Eros and civilization*, Ariel, 2003. *N. from t.*

Potential evolutionary consequences

Short-term repercussions

Among all the possible repercussions in the coming decades or centuries, three phenomena stand out: homogenized biotas, a proliferation of opportunistic species and an outbreak of speciation.

(i) *Homogenized Biotas*. Large-scale environmental degradation due to human activities will not only eliminate large numbers of species, but the surviving species that remain will be in largely homogenized biotas. This will be due to various factors: the expansion of agriculture, replacing natural heterogeneity with monocultures; wide-ranging pollution, such as acid rain; deforestation in the tropics and, in some parts, in the temperate and boreal zones; desertification in extensive territories; and widespread environmental degradation, such as global warming. It will also be due to a rapidly increasing process of invasion by alien species and other large-scale mixtures of biota (Drake *et al.*, 1989; Vermeij, 1991; see also Curnutt and Pimm, 1995), of a notable example of which is the widespread introduction of exotic African herbs (☒ ' Antonio and Vitousek, 1992). Some 4,500 alien species have become established in the United States, while in New Zealand 43 percent of flora and 94 percent of land mammals are non-native.

In short, the set of living systems in the biosphere is being reduced by chronic disturbances on a planetary scale (Rosenzweig, 1995). As a consequence, this is leading to profound biotic impoverishment in virtually all regions of the Earth (Woodwell, 1990; see also Walliser, 1995). And, again as a consequence, the biotas will henceforth remain relatively undifferentiated for an extended period, greatly reducing the main biotic foci of speciation (Pimm *et al.*, 1995).

Throughout the prehistoric past, moreover, many of the surviving EEMs did not exactly belong to the more specialized species. Rather they tended to be the most widely distributed species, ecological generalists rather than specialists (Walliser, 1995). This is neither more nor less than what could be expected. Impoverished and disturbed communities often exhibit large variations in species abundance, with only a few species dominating, as opposed to highly differentiated and undisturbed communities, which typically exhibit many species (cf > May, 1988).

(ii) *Proliferation of opportunistic species.* Homogenized biotas thus probably contain a disproportionate number of what are technically known as r-species.¹ These have certain traits in common: they rapidly exploit new empty niches through widespread use of food resources; they generally have short lives, with short intervals between generations; they present high rates of population growth; and are able to adapt to a wide range of environments. All of these characteristics allow them to exploit new environments and make excellent use of “periods of plenty”², and they are precisely the attributes that allow generalist species to become opportunistic species and thrive in a world disturbed by Humans. Some examples would be the house sparrow, the European starling, the common fly, the rabbit, the rat and other species considered pests, as well as many “weeds”.

But this trend toward opportunism comes at a significant cost to the more specialized species. For example, the sparrow is fond of usurping the food stores and nests of many native North American birds, most notably bluebirds³, wrens⁴, and swallows. Some of the populations of these species have been displaced and replaced, making their survival prospects dimmer. The same is happening in the other regions of the world that the sparrow has colonized with the help of humans, especially South America, South Africa, southeastern Australia and New Zealand (Kendergh, 1973).

A comparable situation has arisen in northwestern Europe. Populations of Herring Gull⁵ in the North Atlantic are now⁶ thirty times higher than they were at the beginning of the 20th century, primarily because of increasing amounts of household garbage, sewage, and fishing waste. As a result, some other birds, especially the increasingly rare terns⁷, are suffering due to competition for nesting sites. Fewer than 500 breeding pairs of Roseate Tern remain in Britain today⁸, a fifth of the number in the late 1960s (possibly only 80 pairs) (Lloyd *et al.*, 1991; Wingfield-Gibbons *et al.*, 1992).

While generalist species will normally benefit from the biodiversity crisis, specialist species, especially predators and parasites, are likely to suffer disproportionate losses. This is due to the fact that, in principle, their quantity is normally much smaller

¹ “R-selected species” in the original. It refers to the so-called, in ecology, r/k selection theory. In a very summarized way we can say that, according to this theory, there would be two different basic strategies in living beings when it comes to reproducing: one, the r strategy, based on increasing the number of offspring and reducing parental care and the other, strategy k, based on increasing the quality of parental care and reducing the number of offspring. This implies a series of biological differences between species that follow one strategy or another. Also, the effectiveness of each strategy varies by environment. *N. from t.*

² “Boom periods” in the original. *N. from t.*

³ “Bluebirds” in the original. *N. from t.*

⁴ “Wrens” in the original. *N. from t.*

⁵ “Herring gull” in the original. *Larus argentatus*. *N. from t.*

⁶ Please note that this article was written in 1996. *N. from t.*

⁷ “Sterns” in the original. *N. from t.*

⁸ “Roseate stern” in the original. *Sterna dougalli*. *N. from t.*

and that they have more demanding lifestyles than generalists. Since specialists are usually the creatures that serve as natural controls for generalist populations, there will be little else to keep generalists in check. Today fewer than five percent of all insect species deserve to be called pests (Pimentel, 1991), yet if extinction patterns tend to favor generalist species, the result may be a situation in which species opportunists increase to become pests (Gould, 1991). In short, human communities could soon find themselves in a world with an ecology of "pests and weeds."

(iii) *A burst of speciation?* At the same time there is an aspect of the presumably constructive EEM. Some of the disturbing processes that cause EEM could also lead to an explosion of speciation, that is, the formation of new species (for general references on this broad topic, see Otte and Endler, 1989; Nietcki, 1990; Rosenzweig, nineteen ninety five). Three categories of human-caused disturbances can be considered: habitat fragmentation, introduction of new materials into habitats, and environmental disturbances that open up new niches.

When populations of species are separated from one another, as occurs when humans destroy swaths of habitat across a species' range, each population is caused to develop independently. These separated populations eventually become so different from each other that they can no longer reproduce among themselves, at which point they become new species (Levin, 1988; Quinn and Harrison, 1988; Kruess and Tscharncke, 1994). The results of this separation process can be seen in the great lakes of East Africa (Lowe-McConnell, 1993; Meyer, 1993). In Lake Tanganyika there are about 150 species of cichlid fish that are endemic to the lake (meaning they cannot be found anywhere else), while in neighboring Lake Malawi there are about 500 species of cichlids. Although the two lakes are not separated by more than 300 km from each other (they were once a single large lake), they do not have a single species of cichlid in common. At some point in the past, an ancestral species that lived as a single population must have begun to split into smaller populations, probably due to changes in the coastline that isolated groups of fish from each other. The microhabitats of each of these populations gradually led to the formation of hundreds of new species. In a small branch of Lake Victoria, called Lake Nabugabo, which was separated from the mother lake only 4,000 years ago by a band of sand less than 3 km wide today, there are six species of *Haplochromis* *em* >, five of them endemic (Greenwood, 1965). These are some of the "youngest" fish species known. Under natural conditions, then, certain fish communities can radiate, or form many new species, in a relatively short period of time (Avisé, 1990; Keenleyside, 1991). Some data suggests that significant genetic changes can occur in cichlids in as few as five generations, and that even a few cichlid species may have appeared in the last 200 years (Owen et al., 1990) .

Phylogenetic analyzes suggest that up to 71 percent of all speciation events have been initiated by the geographic separation of an ancestral species into two or more relatively large and isolated populations (Wiley and Mayden, 1985; Lynch, 1989; See also Brooks *et al.*, 1992). This process can be greatly accelerated when human activities cause habitat fragmentation, a phenomenon that has become increasingly frequent and

significant (Shorrocks and Swingland, 1990; Saunders *et al.*, 1991; Nee and May, 1992; Robinson *et al.*, 1992).

A second type of disturbance that can greatly accelerate natural evolutionary processes is the introduction of new resources and other materials into a species' environment (Rosenzweig, 1995). In Hawaii, for example, there were no bananas until humans introduced them around 1,000 years ago, after which several species of moths in the genus *Hydylepta* appeared. These new moths feed exclusively on banana trees, while other species in the genus feed on grass, sedges⁹, lilies, palms and legumes (Gagne, 1988; see also Simon and Sugden, 1987 and Horwarth *et al.*, 1988). It is to be expected that many such introductions of foreign materials into the habitats of species will occur as humans intensify their activities around the world thanks to an increasingly integrated global economy, the growth of international trade in basic products and the expansion of modern means of transportation.

Similarly, in the last century in Great Britain we witnessed the appearance of moths, of 100 species in all, that exhibited melanism as a result of the accumulation of industrial soot in the environment (Kettlewell, 1973). It seems likely that there has been a continued spread of other particulate matter and other contaminants. And by the same token, it also seems likely that species with genetic adaptations to their new environment have quickly appeared. For example, mosquitoes, along with 500 other species of insects, have become resistant to DDT and other pesticides (Georghiou, 1990), and there are weeds adapted to growing on lead and copper mine tailings (Antonovics *et al.*, 1971). These are far from becoming new species yet, but they could become so in the future.

Third, disturbance of natural environments tends to open up new niches (ecological 'living space'), thus allowing a few species to expand their range and diversify (Rosenzweig, 1995). In North America, for example, the expansion of agriculture and the proliferation of urban garbage in the early 19th century created a rapidly expanding niche that remained empty until the English sparrow, also called the house sparrow, arrived in the mid-1800s. of that century. The sparrow exploited these new opportunities and quickly colonized much of the continent. Although the sparrow has been in North America for little more than 100 years, it has already developed several different races, including subspecies (Kendergh, 1973; Arnold, 1992).

A similar example is the coyote. Because the wolf and other competing carnivores have been largely eliminated, and because growing cattle herds offer abundant prey, the coyote has expanded its range throughout the 20th century until it can be found today in all the [continental] states of the United States. As a consequence, the eastern coyote, which is about a quarter larger than the western coyote and may have some

⁹ "Sedges" in the original. *T.N.*

genes from the Algonquian wolf¹⁰, deserves to be considered a subspecies today (*cf* Leitch *et al.*, 1994; Wayne and Gittleman, 1995).

These examples demonstrate how, under certain circumstances, disturbance of the environment by humans can stimulate speciation (Rosenweig, 1995). However, no acceleration of the rate of speciation will even remotely offset the rate of extinction. While the definitive processes of extinction can occur in only a few decades, and sometimes in only a year or less (a mountain range in a tropical forest with hundreds of endemic species can lose its forest habitats during a single season (Gentry, 1986)), the time required to produce new species is much longer. It takes decades for extraordinarily efficient competitors such as certain insects, centuries if not millennia for many other invertebrates, and hundreds of thousands or even millions of years for most vertebrates. (Some plants, by contrast, can speciate at a remarkably rapid rate, thanks to polyploidy¹¹: occasionally in only 100 years or even less (Gentry and Dodson, 1987)). While the current extinction rate is estimated to be in the tens of thousands of species per year (Erich and Wilson 1991; Wilson 1992; Myers 1994), the rate of speciation could be as low as 100 species per year (an estimate based on in a global amount of 10 million species and in an average period of existence of 100,000 years for each species) or even only one a year or possibly less than one every ten years (if we base ourselves on an average period of existence of 1 to 10 million years). A recent calculation (May, 1988) suggests that the current speciation rate may be only one millionth of the extinction rate.

Probably the most important factor of all in driving speciation is that large-scale species extinctions will empty out a multitude of niches. This supposedly should allow new species to emerge more quickly than when there are abundant and highly diversified species. In this sense, an EEM can be an invigorating phenomenon. After the crisis at the end of the Permian, the surviving oceanic beings ended up filling more niches with more diverse communities. Also after other EEMs, there seems to have been a release of some kind of 'brake' on diversification that was in place during the preceding period, with which—as both paleontological and molecular evidence shows—certain surviving groups exhibited unusually rapid rates of speciation and of radiation (Benton, 1995). The classic example is the sudden advance of mammals after the Cretaceous crisis.

¹⁰ There is no agreement among zoologists as to whether the Algonquian wolf is a separate species (*Canis lycaon*) or a mere subspecies of the common wolf (*Canis lupus lycaon*). >). To further confuse the blanket, some zoologists propose that it is a variety of the American red wolf, which in turn is not clear if it is a mere subspecies of the common wolf or a separate species (in which case the Algonquian wolf would be: *Canis rufus lycaon*). *N. from t.*

¹¹ Polyploidy is the possession by organisms of several complete sets of homologous chromosomes. Since each species has a certain number of chromosomes, adding or removing complete sets of chromosomes changes the species. *N. of. t.*

In general, however, too little is known about this future change in principle and it will take too long to become apparent in practice for an accurate forecast to be made at present.

Long term repercussions

Now we can consider the future in a longer term, the next million years; for this is the period during which some basic evolutionary processes are likely to remain degraded and slowed down before a slow recovery can begin. Five possible consequences can be pointed out.

(i) *Destruction of “evolutionary generators” in the tropics.* For a long time it has been considered (Darlington, 1957; Mayr, 1982) that practically all the main groups of vertebrates and many of the great divisions of invertebrates and plants originated in wide areas with warm and stable climates. Similarly, it is assumed that the highest rates of evolutionary diversification and biological formation—whether through the proliferation of species or through the appearance of significant new adaptations—appear to have occurred in the tropics (Stanley, 1981; Stenseth, 1984; Jablonski, 1993). The tropics with their exceptional numbers of species might well have served as a hotbed of evolutionary novelty, rather than a museum-like collection of accumulated diversity (Stenseth, 1984; see also Jablonski, 1995).

Furthermore, tropical species, especially again tropical forest species, appear to last only for brief periods of geologic time. This implies a high rate of evolutionary change and the existence of explosive episodes of speciation (Raup, 1986; Gentry and Dodson, 1987). Citing Jablonski (1993), the tropics seem to have been the main source of biological formation and novelty, indeed “the engine of biodiversity”, for at least 250 million years. Similarly, the tropics, with their abundance of species with narrow niches and limited distributions, have always outperformed the non-tropics in both relative and absolute extinction rates (Jablonski and Bottjer, 1990; Rohde, 1992; Jablonski, 1993).

Today, the forecast of severe destruction, if not virtual elimination, of tropical forests, wetlands, estuaries, coral reefs and other biomes of the tropics, with their exceptional abundance and diversity of species, may come true. Species and with their unusual complexity of ecological functions (Groombridge, 1992; Myers, 1995). However, some of these biomes appear, at least in some sense, to have served as important ‘generators’ of evolution in the past, that is, they have been constantly producing more species than other environments (Jablonski, 1993; Roy *et al.*, 1994). Hence its decline could well have serious consequences for biological formation, speciation and the other key processes that will occur when the biosphere recovers from the current EEM.

(ii) *Decline in biodisparity.* A burst of species extinction is not the only way to detect an EEM. There may be a decline in both biodiversity and biodisparity, the latter understood as traits manifested by, say, morphological variety (especially in

body sizes and shapes) within a clade (Russell *et al.* ; Jablonski, 1995; see also Nixon and Wheeler, 1992; Foote, 1993). This other form of impoverishment can be determined by the alternative measure of the loss of genders or even families. Genera have been disappearing in disproportionately larger numbers than species over the last 2,000 years (Russell *et al.*, 1995), that is, during the early stages of development of the current EMS, when species Extinctions have been occurring at several times the background rate (Pimm *et al.*, 1995). In other words, there has been a greater loss of taxonomic diversity than of species diversity, due to the elimination of genera with few species. Therefore, the extinction does not seem to have been random. Will it follow the same pattern in the future?

(iii) *Decline of megavertebrates.* It is possible to speculate about impoverishing changes on a more limited but still significant scale. Especially, terrestrial vertebrates with large body sizes, high trophic needs and wide distribution areas will be hit hard (Ceballos and Brown, 1995). These factors, which are often associated with traits of the k-species, such as low population renewal rates, will most certainly make a large part of the macrofauna unusually sensitive to habitat loss due to the expansion of human activities (Pimm, 1991). We can hardly expect these species to be preserved in the long term in protected areas. Due to isolation effects and delayed collapse processes, even 10,000 km¹² parks and reserves (larger than the largest park in the contiguous United States, Yellowstone) could well lose many of their large vertebrate species (meaning "large" any animal weighing more than a few kilos), if not all, in a few thousand years. A few parks of that size have been created, but the options to create more are fast disappearing. Certainly, park managers could implement measures to safeguard critically depleted gene pools, but this is a challenge that is barely taken into account in scientific theory, let alone in practice. Based on what we know of the Cretaceous crisis, we can anticipate that mammals surviving the current EMS may be limited to creatures no larger than bats, rodents, shrews, raccoons, or small canids and felids.

(iv) *The end of large vertebrate speciation.* There is an associated factor that similarly reflects the possible outlook for specific taxa. Only an exceptionally large network of protected areas could ensure that large-scale speciation continues to occur in the future. Even small vertebrates need unimaginably large areas if they are to maintain their ability to generate new species. Lizards do not form new species on islands smaller than Jamaica (with 11,000 km¹³). Small mammals seem to require islands as large as Cuba and Luzon (with about 110,000 km¹⁴), while larger mammals such as jackals seem to require an area the size of Madagascar (with 600,000 km¹⁵) (Soulé, 1980). (On the island of Saint Helena, on the other hand, with its 120 km¹⁶, being an oceanic island with no connections to the mainland, there are 159 endemic species of Coleoptera

¹² Original title: *The Vanishing face of Gaia.*

¹³ Original title: *The Vanishing face of Gaia.*

¹⁴ Original title: *The Vanishing face of Gaia.*

¹⁵ Original title: *The Vanishing face of Gaia.*

¹⁶ Original title: *The Vanishing face of Gaia.*

(Basilewsky *et al.*, 1972). The view that there will always be speciation among the big cats is probably outdated, they all require vast ranges to maintain populations large enough to spawn new species. And the same is true of elephants, rhinos, giraffes, great apes, bears, condors, and great raptors; in fact, it is true of most, if not all, vertebrates above relatively diminutive size.

(v) *Restrictions on innovation, biological training and adaptive radiation.* There is also the question of how the biotic crisis will affect the concrete processes of innovation, biological formation, and adaptive radiation—phenomena that in the past have served as “the main source of macroevolution” (Jablonski, 1986; Erwin *et al.*, 1987; Jablonski and Bottjer, 1990). It is these key innovations that allow the exploitation of new habitats and other resources as they activate evolutionary radiations (Jablonsky and Bottjer, 1990).

After a perhaps prolonged initial period of reduced activity, enough “ecological space” might emerge to fuel biological formation—assuming that the new elements that often seem necessary to trigger biological formation are available. The evolutionary success of flowering plants, which have increased from 100,000 species in the late Cretaceous to 235,000 species today, has been due to key innovations in clade origins (Sanderson and Donoghue, 1994), similarly to how new adaptations have been the source of rapid diversification among cichlid fishes and Galápagos finches. What comparable phenomenon can be foreseen for the future?

Similarly, what forms of explosive radiation are possible when not plausible? Could a “sudden burst of evolutionary momentum” (Feduccia, 1995) occur in higher taxa such as small mammals in the style of, and on a scale comparable to, what happened with the early Cenozoic bird radiation¹⁷[cclix], interval in which all modern bird orders were established in only 5-10 million years?

Implications for conservation planning

All of these issues raise questions so important that conservation biologists can barely imagine them. Is it satisfactory to simply safeguard as large a number as possible of the planetary species pool? Or should more attention be paid to protecting endangered evolutionary processes? The question of biodisparity is of vital importance. Quoting Jablonski (1995), “If we are concerned with avoiding the loss of particular functional groups, or with maximizing reserves that serve as a potential source for evolutionary recovery, then biodisparity measures might offer a more appropriate model of how biodisparity should be used. priorities should be established, as they go beyond the mere number of protected taxa.”¹⁸

From this follows a related question. Should the evolutionary *status quo* be maintained by preserving specific phenotypes of specific species, or is it preferable to maintain phylogenetic lines that allow certain evolutionary adaptations to persist, and from

¹⁷ The Cenozoic Era began about 65 million years ago and extends to the present day. *N. of. y*

¹⁸ “Biodisparity measures may provide a more appropriate assessment, beyond sheer numbers of taxa, of how priorities should be set” in the original. *N. from t.*

there to form new species? (Erwin, 1991; Franklin, 1980) Is it enough, for example, to merely maintain the two extant elephant species, or is it preferable to try to keep open the possibility of new elephant-like species appearing in the distant future?

This is an unusually important question, with unusually important implications for conservation strategies. Elephants, along with many other large mammals, tend to roam quite a bit, a trait that enables them to maintain gene flows over large areas. As a result, the set of all genes in their populations is generally quite uniform (an elephant from East Africa may not be much different from one from South Africa, 4,000 km away (Franklin, 1980)). Some biologists even assert that the remaining elephant populations, while large and extensive (albeit fragmented and rapidly declining), are probably already below the minimum number of individuals needed to keep open the possibility of speciation (Georgiadis *et al.*, 1994).

In stark contrast to elephants and their slow reproductive rate, many insect species have immense reproductive capacity and rapid turnover times. These latter traits provide rapid adaptability to changes in the environment, as genetic changes are quickly passed on to other generations. This not only makes the insects well equipped to survive environmental disturbances caused by human activities, but also gives them an exceptional opportunity to speciate in a comparatively short time. In contrast, elephants, along with other mammalian species that reproduce slowly and therefore have reduced genetic adaptability, such as rhinoceroses, bears, great apes and whales, will be at an extreme disadvantage. Does this mean that these species should therefore receive the highest attention from conservationists or, conversely, that if they were forced to choose these species they should have lower priority? This is a momentous question; and yet it is almost never raised.

And an even more important question arises regarding those centers of biological formation and radiation lineages that serve as "evolutionary fronts" (Erwin, 1991). From the perspective of future evolution, it is certainly more appropriate to preserve primordial radiation potential than to emphasize the main focus of many of today's conservation programmes, ie individual taxa and especially endemic taxa. The latter rarely radiate and preserving them is something like saving living fossils —objects worthy of interest, but with little effect when it comes to protecting evolutionary processes in order to generate biodiversity in the future. And the same goes for functional groups that increase the potential for evolutionary recovery (Jablonski, 1995).

In general, the forecast is that, as a result of the current EEM, many of the evolutionary processes that have been maintained throughout the Phanerozoic¹⁹ will slow down, if not impoverish, for a long period of time. . Quoting the vivid expression of Soulé and Wilcox (1980), "Death is one thing, the end of births²⁰ quite another". This does not mean, of course, that evolution itself will stop, or even that speciation will

¹⁹ The Phanerozoic is a geological eon that began about 545 million years ago and extends to today. *N. of. t.*

²⁰ "End to birth" in the original. *N. from t.*

be put on hold (except for megavertebrates). In fact, there may be enough creative disturbance in certain environments to drive some extremely rapid microevolutionary advances, accompanied by bursts of (localized?) speciation. However, the chances of speciation on the scale that characterized the last few hundred million years are certain to be reduced.

These, therefore, are some of the aspects that should be taken into account as a fundamental change in the course of evolution is imposed. This impending upheaval can be considered one of the greatest biological revolutions of all paleontological eras. It might even equal, both in scale and importance, the development of aerobic respiration, the rise of flowering plants, and the rise of limbed animals. But while these last three diversifications in the life course are advances, the foreseeable diminution of many evolutionary capacities will constitute a profound setback. In other words, citing Wilson (1992), in the history of life there have been five great revolutions: the appearance of prokaryotic organisms, that of eukaryotic cells, that of multicellular organisms, that of cultural species and finally that of a species that can actually take control of evolution. The first four great milestones, which radically altered the course of evolution and ushered in quantum expansions in the Earth's species pool, were separated from each other by periods of about a billion years. The fifth milestone has followed the fourth after an interval of only two million years.

Even more significantly, the future of evolution is being "decided" in an almost total scientific vacuum—decided all too unconsciously, but in a real and increasing way.

Conclusions

The future decimation of evolution should be considered one of the most challenging problems biologists have ever faced. It offers a rare opportunity to study evolution in an early state of extreme disturbance. There are abundant opportunities for innovative research at a time when life's abundance and diversity seem poised for both unprecedented reduction and revolution.

All of this will have profound impacts on human societies during a recovery period that will last at least five million years, possibly several times longer. Today's society is certainly imposing a decision on behalf of at least the next 200,000 generations, without consulting them. This must be considered the most far-reaching decision on behalf of such a large number of people ever made during the entire course of human history. Assume that the Earth's population stays around an average of 2.5 billion people for the next five million years, with each generation lasting 25 years. The total affected will be 500 billion people, and to get an idea of this number, note that 1 billion seconds lasts 32,000 years (Myers, 1993b).

In short, the future of evolution should be considered one of the most challenging problems humanity has ever encountered. After all, *Homo sapiens* is the first species that has been able to look at the natural world and decide whether to remake part of

it, to determine evolution consciously. As has already been observed (Woodruff, 1989), the nineteenth century witnessed the discovery of evolution as a phenomenon and the twentieth century has focused on analyzing and clarifying the manifestation of this phenomenon to date. It would be appropriate that this end of the century be marked by a comprehensive and systematized attempt to investigate this sudden change in the course of evolution, probably the largest in 50 million years and which has occurred for the most part in just 50 years. . Although Charles Darwin would have deplored the global impoverishment that is taking place, if he were alive today he would surely have rejoiced at the opportunity to witness - and document, analyze and evaluate - what could be considered one of the "experiments of the world". " of greater importance that have ever been carried out on the biotas of the Earth.

Finally, let us remember that *Homo sapiens* is the only species in the history of life capable of redesigning the course of evolution. And at the same time, human beings are also the only species with the ability to steer evolution along paths that are beneficial—assuming enough scientific understanding is achieved.

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THE IMPLICATIONS OF STOPPING DEFENDING PARKS

With the main philosophical arguments against protected areas refuted, we can examine the strategic implications of not requiring full protection. When environmentalists do not demand protection, it generally, at best, has one of two consequences:

1. A moratorium on destruction, by court order (in the United States) or by simple government decree (in Canada). Moratoriums can always be repealed, so the same fight will be repeated over and over again, except that the political circumstances may not be so favorable the next time; new anti-environmental politicians may be in power, there may have been an increase in the strength of the “smart use” movement¹ or the environmental movement may be in the doldrums. Moratoriums are not the solution.

2. A compromise solution in which the pristine character of the area is diminished. This may include smaller clearings, limited road construction, or, most likely, the implementation of alternative logging suggested by the environmental group on duty (which, as I said, is not a replica of nature). . These compromise solutions are often more difficult to reverse than outright destruction, as they may please much of the more moderate environmental movement. Meanwhile, albeit at a slower rate, the wilderness is progressively engulfed.

CONCLUSION

Clearly, direct demands for the establishment of protected areas are necessary if wilderness is to be saved once and for all². Of course, there is no guarantee that protected areas will not be open to exploitation in the future, but there is no guarantee for anything in society; protection is the surest way to guarantee the survival of native biodiversity.

Sometimes when building a coalition with environmental groups that share our opposition to a development project, a direct demand for protection can destroy the

¹ “Wise use” in the original. The “Wise Use” movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

² “Wilderness areas” in the original. *N. from t.*

alliance. Some of the individuals in the area may be against the drilling of gas wells in that area but still want to continue to graze their cattle in it, or they may be opposed to logging plans but still want to set traps to sell skins. . In such areas, conservationists must use their own judgment to decide whether the coalition deserves to temporarily give up protecting an area. In any case, the ultimate goal of the campaign should be complete protection once the immediate threats are eliminated. Furthermore, one must ask whether coalition with other groups is desirable in the context of a general campaign, especially if such groups are opposed to all forms of protection and will end up becoming our opponents once the common threat is gone. As a general principle in wilderness campaigns, the sooner full protection is called for, the better.

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Presentation of “Edward Abbey, the spark that ignited Earth First!”

We present below a text about the American writer Edward Abbey. This is a text that narrates how Abbey’s literary work influenced the American conservation movement and, especially, to what extent it inspired the creation of the Earth First! movement. Edward Abbey and Earth First! they are an example that an environment with wild ecosystems, like the one in the United States at the time of Abbey, can give rise to a culture of the wild and this, in turn, to a movement that takes wild Nature as a reference or fundamental value . In addition, for those who are not familiar with Abbey’s writings, the review is a good start to understand what the reader can find in the work of a writer who reflected in it his love for wild nature and the freedom that this supposes. Those are the reasons why we consider it interesting to publish this review.

However, Abbey’s work and ideology are also an example of how a wrong way of thinking can lead a movement to failure by perverting its original values and goals and thereby diverting its forces into ineffective, absurd and even nonsensical struggles. counterproductive. In this sense, the author of the text (Rik Scarce) is very benevolent towards Abbey and has not taken into account, in particular, two aspects of Abbey’s ideology that do no favors for the defense of wild Nature:

- **Abbey considered himself an anarchist.** Anarchism, at least in its most common version (anarchosocialism) is a leftist ideology (its values are those of leftism and its agenda is issues related to social justice). Leftism is currently the predominant ideology in techno-industrial society and, in various ways, favors development and progress, that is, what Abbey was so determined to keep out of the wild places. In addition, although he could not have foreseen it beforehand, in the end the inclusion in Earth First! of too many people who did not take Wild Nature as a fundamental value, but issues related to social justice (leftism), ended up making said movement stop having the defense of Wild Nature as a priority objective, or what is the same, that said movement was perverted and spoiled (see, for example, the text on Earth First! ”How the Earth stopped being first”, in Indomitable Nature: [<https://www.naturalezaindomita.com/textos/criticism-of-civilization-and-of-the-techno-industrial-system/of-how-the-earth-ceased-to-be-first>][<https://www.naturalezaindomita.com/textos/criticism-de-la-civilizacin-y-del-sistema->][<https://www.naturalezaindomita.com/textos/crtica-de-la-civilizacin-y-del->

sistema-tecnointustrial/de-cmo-la-tierra- stopped-being-the-first][techno-industrial/
how-the-earth-stopped-being-the-first)].

- **Abbey was not clear about the incompatibility between wild Nature and techno-industrial society.** Despite what Scarce says at the beginning of the text (that Abbey rejected things like progress and civilization) actually Abbey showed a more ambiguous and contradictory attitude. Sometimes he rejected progress and civilization and that the development of techno-industrial society interfered with the wild ecosystems that he loved so much. However, on other occasions, such as in his autobiographical work *Desert Solitaire*, he said he had no problem with industrial civilization existing as long as it left certain wild environments alone. Moreover, in that same work, Abbey made it clear that she thought that civilization and progress had brought good things that one could take advantage of while conserving certain wild ecosystems. The belief in the mentioned compatibility is something habitual in many ecocentric conservationists: they want to conserve wild Nature but do not see the link between the destruction that it is suffering and the development of human societies (see, for example, “The importance of Wild Nature wild”, in Indomitable Nature:[<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-importancia-de-la-naturaleza-salvaje>][<https://www.naturalezaindomita.com/textos/naturaleza-salvaje->][<https://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/la-importancia-de-la-naturaleza-salvaje>][y-teora-ecocentric/the-importance-of-wild-nature)].

Edward Abbey, the spark that ignited Earth First!

By Rik Scarce[a]

Edward Abbey called himself a “literary tramp.” I wrote to “share”, to “record the truth, to uncover the hidden lies” and, most importantly, to defend the diversity and freedom of humanity against those forces that in our modern techno-industrial culture would reduce us all, if we would allow it, “to the status of things, objects, raw materials, pawns; to the rank of subjects.”[397] He despised anything taxing, controlling, pretentious, or abusing the land. Authority, growth, progress, civilization - these were his enemies. The spirit of Jefferson, Whitman, the eagle, the coyote, the sandstone and the river came together in a “skinny, hungry, bohemian bard with a notebook and a pen (his ‘software’)”, as he described himself in his latest novel *Hayduke Lives!*, characterized as a lone chronicler of an Earth First! action.[2,b]

In this volume, Abbey completes a circle that began with *The Monkeywrench Gang*,[3,c] her comic, irreverent, cartoonish and easily readable novel published in 1975. Earth First! It arose out of circumstances that Abbey could not have foreseen, but many of the movement’s strategies, tactics, and attitudes mirror those in *The Monkeywrench Gang*. The book follows a motley crew of of four individuals who decide to put a stop to any type of destruction they encounter in the southwestern United

States. One of the protagonists is AK “Doc” Sarvis, a medical doctor; another, his lover/nanny, Bonnie Abzug; another George W. Hayduke, Vietnam veteran (Green Beret) and explosives technician extraordinaire; and finally, Seldom Seen Smith,[d] a nervous non-practicing Mormon[e] (inclined to dissent) and *rafting* expert. The protagonists meet on a *rafting* excursion guided by Seldom Seen. From that moment they embark on a Neo-Luddite rampage, pursued at all times, through dusty roads and steep cliffs, by the Mormon bishop and Utah law enforcement officer, J. Dudley Love. This playful journey through the canyon country of southern Utah and northern Arizona preceded *Ecodefense*,[f] by more than a decade, as a how-to guide to the most damaging eco-defense methods for the technology. The Band burns billboards; it wrecks bulldozers - or throws them off cliffs; they scatter caltrops, twisted metal spikes, across the road to disrupt Bishop Love’s pursuit; they ruin equipment for drilling oil wells; railway lines on which mining trains circulate are blown up; the marking stakes of the layout of new roads are uprooted; and they vandalize “Smokey the Bear”[g] signs with impunity. They drink, they swear, they fear for their lives and they are shot at - all in defense of Mother Earth.

The book, like most of Abbey’s work, ridicules numerous customs, beliefs, perspectives, and ways of life. The author once wrote, “If there is anyone present whom I have not yet insulted, I apologize.”¹ The characters that he uses to launch the offenses are full of contradictions, many of which are a reflection of the radical environmental movement but are often overlooked by those who are addicted to “ideology” and “dogmatic” labels. The members of the Gang are willing to die for the wilderness[h] but they see no problem in throwing beer cans out of the car window while driving on any road that has been built without their consent. After spending time in the wild[398] the Gang misses the hot showers, cake and coffee at Holiday Inn hotels. The mechanical devices come under continued attack from the Gang, however Hayduke feels a deep attachment to his Jeep. Anyway, the Abbey Gang doesn’t waste their time at all trying to work out individual or group inconsistencies like most of the rest of us do. To do so, in her case, would interfere with the liveliness of the story and hide one of the truths about us that Abbey surreptitiously exposes.

In *Hayduke Lives!*, which Abbey finished writing shortly before her death in March 1989, Hayduke brings the Gang back together for one last massive eco-sabotage, as members of Earth First! they drive spikes into trees[j] and suffer brutal treatment by Bishop Love and other authorities. Meanwhile, Abbey keeps turning up unexpectedly. The physically detached but emotionally involved journalist watches in amazement from the sidelines as the movement he inspired takes a beating and keeps kicking.

¹ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

Many consider *The Monkeywrench Gang* to have had a disproportionate weight in inspiring the founding of Earth First!. Its main importance was probably that it influenced the formation of the ideas and values that Earth First! adopted.

In her many essays, Abbey's eloquence shines through even more than it does through the voices of her fictional characters. In books like *Desert Solitaire*, [5,k] *Abbey's Road* and *One Life at a Time, Please*, Abbey develops her favorite themes: the freedom, love for all that is wild and our obligation to defend it. The best of his writings constantly bring new wonders to light. Canyon walls whose blinding brilliance is almost palpable. The reader navigates churning river rapids and writhes, wriggles, and zigzags with two bull-snakes² entwined in a courtship ritual. Abbey breaks down the ills of "industrial tourism" and explains how to solve them. It dismantles modern literature by revealing its subservience and explores the primitive incarnations of the novel and the essay in an attempt to unearth the political, argumentative, and inventive qualities that are necessary to make them valuable again.

Abbey is by no means the only essayist or fiction writer that radical environmentalists turn their attention to when looking for a literary reference. Abbey offered a list with a few others: Edward Hoagland, Joseph Wood Krutch, Wendell Berry, Annie Dillard, John McPhee, Ann Zwinger, and Peter Matthiessen. Frley Mowatt should be added, as should Wallace Stegner, Rachel Carlson, Loren Eiseley, John Muir, and the many other "nature writers" who present an ecocentric point of view in their writing. None of them is as consistently explicit as Abbey in his defense of the destruction of industrial civilization. Rather they are political, in the sense that they offer alternatives. But they also revere natural landscapes and deplore the destruction of wildlands at the hands of humans. The impact of her works is on individuals and the way people act, not like Abbey's writings had an impact on Earth First!, or on any other aspect of the radical environmental movement taken as a whole. , and gave voice to some of the values commonly espoused by ecoguerreros. On the other hand, none of these other authors angered some potential friends of the movement as much as Abbey did. His honest yet insensitive comments and character portrayals offended many and, to the extent that he was seen as the literary incarnation of Earth First!, he undoubtedly cost the movement a large following; although it may also earn many more thanks to him.

Grades:

1. Edward Abbey, *Abbey's Road* (New York: EP Dutton 1979), pp. xxii-xxiii.
2. Edward Abbey, *Hayduke Lives!* (Boston: Little, Brown and Company, 1990), p. 239.
3. New York: Avon, 1975.

² "Gopher snakes" in the original. *Pituophis catenifer. N. from t.*

4. Edward Abbey, *One Life at a Time, Please* (New York: Henry Holt, 1988), p. 5.
5. New York: Ballantine, 1968.

Oil production

We are here

Graph II: Oil “production” in long-term perspective from the 17th to the 25th century

Energy -and in industrial society this means fossil fuels- is not one more aspect of the economy or one more resource among others, as economists think, but it is the basis of the entire economy and the fundamental resource to be able to use all others. Oil and other fossil fuels are the lifeblood of the industrial economy for all important activities: manufacturing, transportation, agriculture, industrial and mass production, tourism, military activity, mining, electricity production, etc. Without them, nothing can work. Especially oil -with its versatility, ease of transport and storage and high quality and thermodynamic density- has played a crucial role in the demographic and technological expansion of the last 100 years. Conventional oil always had a very favorable (although decreasing) EROI¹: 1:70 (one barrel consumed for every 70 barrels extracted) in 1970[m], 1:30 in 1970 and 1:10 today in day. The low prices of fossil fuels, mainly oil, have always been the basis for optimism and the economic expansion of industrial societies, especially the great boom after World War II. The golden age of neoliberal globalization, during the 1980s and 1990s and until recently, was only possible because of the constant flow of cheap energy into the world economy and trade. And, on the contrary, the largest economic contractions and increases in unemployment (“recessions” in the terminology of conventional economics), during the last 60 years, have been caused mainly by increases in the price of oil. “Cheap energy” here means cheap net energy flow (ie amount of energy usable for some industrial purpose, not amount extracted). A low net energy price usually (but not necessarily) means a low market price for oil and other energy sources.

Fossil fuels are non-renewable energy sources and there have always been warnings about their depletion, especially regarding oil, from the 1920s onwards. But the discovery of new oil fields was increasing steadily, with large discoveries first in North America in the 1920s and 1930s and then in the Middle East after 1940. The peak of discoveries occurred in the 1960s (see chart III), but although there were some big discoveries later, such as in the North Sea in the 1970s, the rate of discoveries was steadily slowing down. As long as the discoveries cannot replace the existing oil fields,

¹ “EROEI” in the original. Energy Return Rate, in Spanish. It is the quotient between the amount of energy that is necessary to use or contribute to exploit an energy resource and the total amount of energy that said energy source is capable of producing. *N. from t.*

the peak will be inevitable and only its date can be a matter of discussion. US geologist King M. Hubbert predicted in 1956 that peak oil for the US (in the contiguous 48 states) would come in 1970. The original Hubbert curve (see chart IV) assumed that “production”² oil would follow an ascending line, reach a peak and then begin to fall, slowly at first and then faster.³ Hubbert predicted peak world oil extraction first in 1995, then in 2000 (“if current trends continue”), but no one listened - even his own company (Shell) tried to silence his analysis - and he died forgotten in 1989. His name has become famous in the last ten years, as men from different backgrounds and professions - retired petroleum geologists, journalists, academic analysts - have ratified his original ideas using more sophisticated models and reaching some different conclusions. The first generation was of retired petroleum geologists, such as Colin Campbell, Walter Youngquist, Jean Laherrere⁴, and Kenneth Deffeyes, and the second was of writers, journalists, and academics, such as Richard Heinberg, James Kunstler, Nate Hagens, Jan Lundberg, Michael Lardelli, Jeremy Leggett, Ugo Bardi, Guy McPherson, Gail Tverberg, Dmitry Orlov, John Greer, Sharon Astyk, Michael Klare, Rob Hopkins, Peter Goodchild, George Mobus, Carolyn Baker, and many others.

Graph III: rate of discovery of oil fields from the 1930s to today with predictions for the future. Note the significant slowdown in the increase in oil “production” after 1980. After 2005, the rate of increase in “production” has been close to zero. The last two successful years were 1999 and 2000, but after that there have been no significant discoveries until 2007 or 2008. There is a big gap in discoveries between 2001 and 2007 and this is oil that should come online by 2009 and beyond. .

² For example: “We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.” (*The Earth runs out*, pages 246-247).

³ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley’s utopia much more accurately predicted the role that sexuality plays in today’s techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁴ “The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace.” (*The Earth Runs Out*, page 237).

Peak oil does not mean the end of oil, but the end of cheap oil or the extraction and consumption of the more easily extractable and better quality oil.⁵ Peak oil means the end of the first (upward) phase of the fossil fuel era. Peak oil is the decline in the ability to produce cheap, economically extractable high-quality oil on demand. The most important thing is not when oil "production" ends, but when it begins to decline. Peak oil means the maximum oil production in a year or in a quarter but it can also refer to the so-called peak plateau, a longer period in which oil production remains more or less stable (unlike the curve Hubbert's original, which assumes a sharp decline in oil "production"). Contemporary peak oil, as we shall see, is simply a plateau of the peak after 2004. The term "peak oil," however, is a bit unfortunate - it does not mean the extraction of half of existing oil reserves, as it has often been said that there may be vast resources of so-called unconventional oil, such as Canadian oil sands or Venezuelan heavy oil. However, EROEI - or Net Useful Energy Extraction - is crucial at peak oil, as the vast resources of "unconventional oil" are of little use if too much energy (and water) has to be consumed to extract them. . For example, large amounts of "unconventional oil" can only be extracted if oil prices are above \$100/barrel; but the economy cannot tolerate such prices for long. Therefore, peak oil is not necessarily a classic case of depletion/scarcity of resources (which can be substituted by something else) but something more important: the end of the favorable value of the EROI, the beginning of the decrease of net energy and the end of economic growth worldwide (although not in each and every one of the countries at the same time).

The first (1973) and second (1979) oil crises clearly showed the great vulnerability of oil imports, especially from the Middle East, in the "advanced" industrial society, and this dependency grew steadily. The US imported around 30% of its oil in the 1970s and today it imports around 70%. The first and second oil crises caused major problems and disruptions in the normal functioning of Western economies, but their effect did not last long as they were caused by rapidly changing political factors - the Arab embargo and the Iranian revolution. Both were minor inconveniences in the long first phase of the fossil fuel age with ever-rising production. The discovery and exploitation of large western oil fields in the North Sea and in Alaska beginning in the 1970s mitigated the situation and helped to overcome the energy crises. But these crises were an early warning for the future. From 1985 to 2002, the average price of oil was between 15 and 20 dollars per barrel (d/b): the basis for the so-called information revolution and the great neoliberal globalization.

⁵ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

After 2000, the price, with some minor fluctuations, grew steadily until the summer of 2008 (see Chart V). When analyzing oil prices we have to look at long-term trends, not short-term fluctuations. In the period 2003-2009 the average price of oil was between 80 and 85 d/b, a huge increase compared to the period 1985-2002. The big rise in oil in 2007-2008, with a price of 148 d/b in the early summer of 2008, was partially caused by stock market speculation, but only due to expectations of ever-increasing demand.[513] Unlike the first and second oil crises, both of which were caused by artificial scarcity, the third was caused by objective geological limits. OPEC[n] was controlling prices from the 1970s until around 2002 and Saudi Arabia was one of the so-called crucial producers, but in recent years this has changed. In 2009 Russia became the largest oil producer in the world, with oil extraction of over 10 million barrels per day (mb/d), although, given the poor conditions of its old fields, it will be difficult to sustain this extraction level.

Chart V: Oil prices from 1996 to summer 2009. Prices grew faster thereafter, above 80 d/b in October 2009. Note the big rise in oil in 2007-2008, but also to the continuous increase in oil prices from 2002 to the summer of 2008.

In the last 15 or 20 years, the last great industrial revolution has taken place in China, India and some other “developing” countries. Demand has been growing rapidly but supply has grown much more slowly, especially after 2004. At the end of 2004, world extraction of all liquid fuels (oil, gas, ethanol) was around 85 million barrels and at the beginning for the summer of 2008, when extraction efforts were at their maximum due to very high prices, was around 87.5 million barrels.⁶ Global extraction of liquid fuels reached a plateau in late 2004 and has fluctuated within a narrow range since then. Peak oil was in 2005, and peak energy (or peak for all liquid fuels) was in 2008. This is the so-called peak plateau, when global extraction remains more or less unchanged and probably⁷ can no longer be increased significantly, no matter how high prices are (see chart VI). Peak oil as an event occurred in 2008 and peak oil as a process continues today as the second phase of the fossil fuel era. Domestic consumption in the OPEC countries and Russia is increasing so fast that each year these countries have less oil to export. High prices imply the possibility of large subsidies for domestic consumers and the promotion of domestic consumption and, given the stagnation of oil extraction, this means less oil to export to Western countries and that, despite the serious economic crisis, prices remain high in these countries.⁸ Peak oil can be identified with the peak plateau or second phase of the fossil fuel era. In the first

⁶ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

⁷ Examples:

⁸ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor,

phase, oil extraction increased continuously, in the second phase it stagnated and in the third phase - which could start any year of these, but probably not before 3 or 5 years, depending on demand - it will decline. The oil industry has been running on a treadmill since 2005 with production remaining essentially unchanged despite oil rising in price to unprecedented levels. Capital for oil infrastructure investments, which could have seen new production continue to offset decline for a few more years, has dwindled. Between 2005 and 2008 the supply did not meet the demand. The actual data for peak oil will only be known after oil extraction begins to descend from the peak plateau, but this fact - the inability to significantly increase "production" despite high prices - shows that peak oil is already here. The arrival of peak oil - or the end of the first phase of the fossil fuel era and the beginning of the second phase - also means the arrival of a great economic crisis, the worst world crisis after the Great Depression of the 1930s.⁹ Ironically peak energy is masked by the economic recession, starting in the summer of 2008, which was mainly caused by peak oil itself. The year 2008 represented, as Richard Heinberg points out, the fundamental break with past decades, the year in which industrial civilization crashed against the wall of ecological limits.¹⁰ Predictions made long ago about "limits to growth" have finally come true.

A large increase in the price of oil was the main cause of the contemporary economic crisis - the economy and especially the credit-and-debit economy with continuous "growth" cannot function normally without abundant and [cheap17] energy - and only It remains to be asked what caused it. The facts tell us that the main reason was an increasingly unfavorable relationship between increasing demand and stagnant supply. Oil companies and organizations like the International Energy Agency think that the main reason for the third oil crisis was a lack of investment (in tankers, drilling technologies, refineries, etc.) due to low oil prices. between 1985 and 2002. This is the opinion of many analysts, especially those who work within the oil industry or in some pro-government agencies, such as the IEA[o] or CERA[p].¹¹ But this does not explain the low level of investment starting in 2002, when oil prices were rising. The oil companies know that the available oil reserves (ie suitable for extraction at a favorable EROI) are much smaller than officially claimed and that the large investments will not pay off. In the oil business, investments may start to pay off after ten years or more, but in

etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

⁹ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁰ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹¹ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

ten years there will be (much) less oil than now, so there are no big investments.¹² For the extraction of unconventional oil (tar sands, heavy oil) a triple digit price (between 100 and 150 d/b) is needed, but the economy cannot tolerate such prices for a long time.

[or] “IEA” in the original. It refers to the International Energy Agency. *N. of the t.*
[p] Cambridge Energy Research Associates. *N. from t.*

Graph VI: “production” (actual and anticipated) of oil and “production” of gas 1930-2050 in billion barrels. Pay attention to the plateau of the 2005-2015 peak.

For conventional economists - simply intellectual academics with some degree of political influence - the foundations of the economy are money and human labor, not natural energy and wealth (“resources” in anthropocentric terminology). For them, the only limiting factors are capital and human labor, not ecological limits. They think that energy is just a resource, but in the real world, energy is the source of all other resources. Contemporary economic theories are the product of robust economic growth in recent decades, so it is natural that they assume faith in everlasting economic expansion. After the 2008 crisis, many economists abandoned neoliberal free market fundamentalism and accepted neo-Keynesianism. Now they think that a lack of state regulation in the financial industry has caused these huge problems and brought us to the brink of collapse. So his advice to governments is: pump money into the banking system, deliver stimulus packages and bailouts, put strong fiscal policies in place and the economy will recover.¹³ This should prevent a repeat of the Great Depression of the 1930s. The contemporary megacrisis is, they believe, just a “recessionary cycle”; one among many, perhaps a little stronger and longer than usual. For them and for the governments, this is just a “financial crisis” with no connection to the energy factor at all. In response to this deepening “financial crisis,” most states have tried to increase their allotment of money. These measures may bring some short-term effects, such as a very limited revival of economic activity in the second part of 2009 and easy political gains for those governments that only think about the next elections, but in the long term they lead nowhere. They only create new problems, such as the great danger of a dollar collapse or a deficit bubble that can easily burst and cause a rapidly worsening economic crisis.

The political and economic elites try to supply the banks with fresh money so that they can lend it to companies for the creation of new jobs and the restoration of the

¹² Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

¹³ I refer, for example, to: “Did humans cause a collapse in the ecosystem of ancient Australia?”, fragment of “Extinct paleofauna of Australia. Rare creatures do not only live today”, Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

old economy. The idea is simple - and wrong, since there is no (cheap) energy in this equation. Without cheap energy there can be no cheap credit. The obsession with money stems from a simple fact: the quantity of money can be unlimitedly expanded, but the quantity of energy - especially cheap net energy - cannot. "Recession" and "depression" are conventional economics terms, and because they carry the idea of a "recovery," they are of no use here. The arrival of peak energy means the beginning of a deep structural crisis of the world economy and industrial civilization as a whole. Simply, mainstream economics - be it liberal or Marxist - is not prepared to deal with this because of its denial of ecological limits and, in the liberal case, blind faith in free market mechanisms. The traditional Right and Left have been and continue to agree on the belief in the quasi-divine human power over nature and in human omnipotence to transcend natural limits. As one peak oil theorist aptly puts it, the Right blames foreigners, "terrorists," and leftists, and the Left blames the rich and big business, but neither approach does much to help. to solve the fundamental problem of the crucial depletion of energy and the aggravation of the mega-crisis. The public blames governments and companies, governments blame "speculators" and oil extractors, etc. Looking for scapegoats is a typical example of outdated thinking, trapped in the anachronistic paradigm of unlimited growth.

For the public and politicians, the 148 d/b in the summer of 2008 was not a wake-up call but rather a stimulus for witch hunts or scapegoating (take your pick and blame the speculators, OPEC, oil companies, government, etc.). Many people think that the increase in oil prices was due to a speculative bubble and, for them, the great decrease in prices, after the summer of 2008, was "proof" of this. There is a popular opinion that peak oil is propaganda by oil companies to justify high oil prices. But in reality the oil companies either do not attach any importance to the issue of peak oil or maintain that it belongs to the distant future. They believe it is more convenient to foster illusions about abundant amounts of oil and gas. However, if this is true, then high oil prices are, at least in part, the result of manipulation by the oil companies. For high prices there can only be two meaningful explanations: either peak oil or manipulation, with substantial involvement of the oil business. Official spokesmen for political and economic elites maintain that much larger oil reserves remain than were previously considered extractable and that "new technologies" will make that oil extractable. But even if that were the case, they often fail to mention the crucial factor: a very unfavorable EROI. One of the reasons why the world economy has become so affluent so quickly over the last few generations is precisely because oil had a very high EROI. In the early days of oil, for every barrel of oil used in exploration and drilling, up to 100 barrels were obtained. More recently, as oil extraction became more difficult, that rate became significantly lower. Certain alternative energy "sources," such as many industrial biodiesel and ethanol production methods or oil sands and shale mining, can actually have an EROI of less than one.

The IEA - created after the first oil crisis in 1973 to monitor energy prices - is the energy "watchdog" of developed countries and many governments design their energy

policies according to the IEA's predictions to the future of global energy demand, supply and production. The IEA has always insisted that peak oil was decades away and even in its last two reports (World Energy Outlook, 2008 and 2009) it stated that world oil production is not expected to peak before 2030. Furthermore, the 2009 report did not convey a sense of urgency about the depletion of oil fields - unlike in 2008 and public comments by some IEA members in 2009. In these two reports the IEA predicted an increase in world oil production, reaching 105 mb/d in 2030 (a very unrealistic prediction, as we have already pointed out). The IEA has often been accused in peak oil discussion circles of downplaying impending shortages for fear of triggering panic buying, and the US is said to have played an influential role in encourage the Agency to understate the rate of decline of existing oil fields while exaggerating the chances of finding new reserves.¹⁴ Almost everyone - the public, governments, industry, bankers, etc. - has an interest in not telling or not knowing what the truth is. If stock market speculators knew the truth, oil prices would jump above 200 d/b in about a week, with devastating effects on the world economy. There is no plan B - nor any remarkable strategy for the near future - among the political and economic elites; there is a great possibility of mass panic in the stock markets and in the public; as well as other dangers. Politicians (just like technicians) can only think from the "problem-solution" perspective, but in this case there is no "solution". And they, as professional optimists, can't talk about bad news except as temporary "problems" waiting to be "fixed." So why tell the truth anyway? Furthermore, peak oil - unlike climate change - is a newcomer that has only started to be discussed more frequently in the last ten years or so. It only has a natural connection to the long-forgotten discourse of the 1970s about limits to growth.

Some Western governments, especially in North America, have probably been aware of peak oil for several years. The US military adventure in the Middle East, especially the 2003 invasion of Iraq, only makes sense in this context.¹⁵ But political elites in the US, Canada or any other country don't talk publicly about peak oil because they believe that peak oil is not peak energy. They probably know that peak oil - and not the lack of state regulation of the financial industry or something like that - is the real cause of the economic crisis but they believe that cheap energy will come back and make possible a return of the old economy and that everything will continue as usual. This cheap energy will not come from conventional oil, but from a mix of "alternatives," such as coal, gas, nuclear fission, wind, solar, and unconventional oil, plus some new

¹⁴ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

¹⁵ "Red pine" in the original. American Red Pine, *Pinus resinosa*. N. from trans.

forms of energy that rely on future technological advances, such as nuclear fusion. The program of the new US President Barack Obama[514] for "clean energy" and "clean technologies" (for the conventional mind, energy and technology are the same thing) has very wide support and popularity inside and outside the United States. USA There is great enthusiasm about technological "advancements", "natural capitalism", "clean energy", "solar revolution", "energy independence", "green revolution" and many other forms of quick "fixes" and "miracles".[515] Different institutions and groups that promise many technological wonders, such as the Breakthrough Institute[q], enjoy wide popularity. However, this is nothing more than a great illusion and a symptom of faith in technological miracles, a very frequent phenomenon in industrial society.

Graph VII[r]: World energy sources and consumption in 2004. Today (2010) the situation is similar, but the percentage of coal and nuclear energy has increased. Note the absolute primacy of fossil fuels which is even greater if their indirect forms are taken into account (that is, they are the energy base for all other energy sources).

Seppo Korpela's apt words - that "humanity is hopelessly trapped in a dilemma unlike any it has ever faced before"¹⁶ - are often reiterated in the literature on peak oil. The vast majority of people - the public, the mass media, the political and economic elites - are not aware of the seriousness of the situation in which human beings find themselves. There is a widespread hope that either the oil reserves are huge, or we can develop alternative energy sources just in time "to leave the oil before the oil leaves us." Unfortunately, there are no such "alternatives". The so-called alternatives¹⁷ - nuclear, solar, wind, geothermal, etc. - are only technologies for the production of electrical energy. Technology is not energy and the "alternatives" are really nothing more than derivatives of fossil fuels. That means we must have huge amounts of cheap oil and gas to be able to develop alternative technologies, but because of peak oil, we don't. Producing "alternative energy" uses up "energy from oil"; Or, to put it another way, all non-fossil fuel and energy sources depend on a fossil fuel-driven economy. Having faith in "clean energy technologies" is simply wishful thinking. In the real world there are only fossil fuels and their derivatives (for the production of electricity). "Alternative" energy sources are simply increasing (rather than displacing) the use of fossil fuels. Industrial societies were built, in the last 200 years, on the energy of fossil fuels and they cannot quickly create - if indeed they can at all - any other energy base. The consumption of other energy sources only increases the consumption of fossil fuels, but does not replace it. In the post-peak oil world the development of "alternatives" will mean a huge increase in demand for oil and gas, the price will rise and the economy will crash or contract into an even deeper recession. The development of "alternatives" is only possible through constant economic growth, but the fundamental requirement for this - cheap fossil fuels - no longer exists.

¹⁶ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

¹⁷ "Sweat lodge" in the original. *N. from trans.*

“Alternative” forms of energy simply cannot replace 30 billion barrels of oil per year (the “net energy” problem) and always have, have, and (probably) will have net energy losses. There are other problems with the “alternatives”, such as their difficult to capture, since the sun, wind or water are not simply in the ground, like oil, gas, or coal, and therefore not always available. and they are highly dependent on the (rapidly changing) weather. If oil prices are low (below 40 d/b) “renewables” are not competitive in the market, and if prices are very high (more or less above 90 d/b), they cannot be extensively developed, since they are derived from petroleum. Hydrogen is a (very inefficient) energy carrier, not an energy source. Nuclear power, which can only produce large amounts of electricity, is too expensive and dangerous.¹⁸ There are significant amounts of coal, but much less than is normally thought and its massive use will drastically increase climate change and pollution in human habitats. Coal cannot help in some sectors, such as transportation or agriculture, which are completely dependent on oil and gas.[28] Oil sand mining in Canada and some other countries is particularly expensive in money, oil (a big problem in the context of peak oil, its ERR is only 1:1.5) and water and has dire ecological consequences, from the contamination of the immediate environment to its contribution to climate change. The same can be said of offshore drilling, even if ecological disasters – such as the recent one in the Gulf of Mexico, when an oil rig sank in April 2010 – are regarded as merely isolated “accidents”.

The second problem with “alternatives” is that there is simply no time for such a massive energy transition. The first oil crisis (1973) was a good (but wasted) opportunity to start the energy transition, since it will take between 30 and 50 years to carry it out. All other energy sources combined will not be able to close the growing supply gap over the next 10 to 20 years. Investing in “alternatives” is a waste of money. Therefore, the era of cheap energy cannot return and without it there will be no long-term recovery. Conventional economists just can’t understand that since resource scarcity is an impossibility for them. If prices rise, production is increased or alternatives are found quickly. But today neither of these two options is possible. This means that all proposals about “sustainable development”, “ecological modernization” and similar concepts are simply claptrap and self-delusion. Technology is not energy and technological innovations are of little use if you continue to rely massively on fossil fuels.¹⁹

Currently, the world economy is in a difficult situation.²⁰ Despite the great economic crisis of 2008, world oil use has fallen by only 2.7%, a fact that shows how dependent on oil the world economy is. When economic activity picks up, demand for oil and oil prices will increase exponentially again as supply will not keep up with demand. The price of oil in recent months -between 75 and 80 d/b- is really astronomical for a state of crisis.

¹⁸ Name from Lakota (of the Sioux language family) for the conical fur-covered tents used by certain native peoples of North America. Also “tepee” or “teepee”. *N. from trans.*

¹⁹ “DNR” in the original. “Department of Natural Resources”. *N. from trans.*

²⁰ “Rat wall” in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

A fundamental condition for recovery is the abundance of cheap energy or the return of oil prices to 15 or 20 d/b. Of course this is not possible. In the midst of the deep (and increasingly serious) crisis, oil prices were climbing up to 70 d/b in the summer of 2009 and above 80 d/b in October 2009. The airline industry - that is to say, of the great airlines; many of the smaller ones have already disappeared - it's on the verge of collapse with such high prices and what's left of the auto industry isn't much better off. The Federal Reserve Bank in the US is issuing more and more currency and credit to prevent banks and mutual funds from collapsing. The US government intentionally devalues its national currency (a common government move in the case of large debt) but a weaker dollar means higher oil prices, not economic recovery. Unemployment is growing continuously in almost all countries. There are several bubbles waiting to burst in a year or two. Governments and the mass media see "green shoots" and "signs of recovery" everywhere, but these are only temporary near-recoveries within a long-term economic contraction.

Bailouts and stimulus packages will not have a long-term effect without the return of cheap energy. There is not, nor will there be, an energy rescue. These measures can only slow down the rate of economic contraction and, because of the large increase in public debt and the state deficit they cause, merely delay the financial collapse of the world economy. Financial institutions cannot function without economic growth, and economic growth is not possible without cheap energy. If the economy really recovers, the oil supply crisis (physical shortage of oil, not just high prices) and a large increase in prices will probably be inevitable. In the era of cheap energy, many people were able to live beyond their means, but that's over. Massive stimulus packages have created massive public debt - and private to public debt transformation - and state budget deficits; an intolerable situation for years to come. Even major institutions - such as the French bank Société Générale in November 2009 - are warning of great danger of economic collapse. The biggest government-sponsored bubble is, of course, in China (and at its ghostly growth of more than 8%), where buildings without tenants, roads without vehicles, and shopping malls without customers or employees are being built. Massive government interventions show that the economy is in intensive care, unable to stand on its own. In the past year, the "fundamental changes" to institutions and regulations that US President Obama promised have not come, there has only been a temporary shoring up of growth-based institutions through a massive increase in debt. Without cheap energy there is no growth, without growth there is no loan repayment and without loan repayment the whole edifice of the debt and credit economy begins to collapse. Governments in many countries have already had to impose "austerity measures" - public spending cuts, tax increases, cuts in wages, pensions and jobs - hoping to reduce intolerable deficits and maintain the confidence of foreign investors. But these measures will either be mere cosmetic gestures or, if seriously implemented, will mean the death of the welfare state, much deeper economic stagnation and economic contraction, and suicide for governments. It is doubtful that governments can continue to insist on carrying out restrictive measures against the will of their own citizens. In

any case, even these tough measures will not be able to prevent the bankruptcy of states under crushing deficits and debt in a year or two.

***II. future trends

Right now, we are in the middle of the first phase (introductory phase) of a mega-crisis, in which world oil production is stable. Or, if we look at the modern age in a larger energy context, we are in the middle of the second phase. The first phase was upward, with oil production always increasing (with minor fluctuations mainly due to geopolitical problems). The "production" and supply of oil were always ahead of demand. This phase ended around 2005. The second phase - of stagnation - began in the last quarter of 2004, with the slowdown in the increase in the rate of "production" of oil. From 2005 to today, oil "production" has been stagnant between 85 and 87.5 mb/d for all liquid fuels and between 72 and 74 mb/d for crude oil. Oil demand began to exceed supply in 2006, and a growing gap can be expected in the near future (figure VII). In the coming years we can expect a worsening of the crisis with a further increase in unemployment and a decrease in demand²¹ due to high oil prices (around 70 d/b is the minimum acceptable or "fair" price for OPEC; the "fair price" was 20 d/b in 2002 and 40 d/b in 2004). In the near future (1-4 years from now; or for as long as the peak plateau lasts) oil prices will fluctuate wildly; the worsening of the economic crisis will make them go down, but OPEC measures and the constantly increasing demand from non-OECD countries²² (the so-called emerging economies) will make them go up; market speculations will act in both directions, depending on the "signs of recovery" and "signs of depression", within a range between 60 and 80 d/b. In the long term, especially after 2012, oil and energy prices will rise due to the ever-widening gap between rising demand and declining extraction. The third phase or downward phase will begin when output begins to fall off the peak plateau²³, slowly at first, then faster, probably after 2012, perhaps even earlier, depending on demand and OPEC capacity. to compensate for the continuous decline in the extraction of non-member countries. Only major demand destruction - and a major depression - can postpone the end of the second phase of the end of the fossil fuel age for several years. This will be the beginning of the real crisis with increasing supply shortages, power blackouts, mass unemployment, high inflation and high prices, at the margin of demand. At that point, even steadily declining demand will no longer be able to help push prices down. The relatively low oil prices in 2009 and 2010 are just the calm before the storm.

The year 2008 is a fundamental breaking point in the history of modern civilization, the end of (expansive) globalization and the beginning of de-industrialization and relocation[t]. That year will be considered, by future historians, as the beginning of the end of industrial civilization. Of course, this has to be understood as a long-term

²¹ "National forests" in the original. *N. from trans.*

²² "OECD" in the original. Refers to the Organization for Economic Co-operation and Development. *N. from t.*

²³ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

process, not as a singular event.²⁴ Traditionally, peak oil analysts have focused their attention on the peak rate aspects of global oil supply. But, the net export of oil is the biggest problem today, since extraction is stuck at a plateau and domestic consumption in oil-exporting countries is constantly increasing. Therefore, each year there is less oil on the international market even if the rate of extraction remains the same. Many peak oil analysts believe that the net oil export crisis will be the defining geopolitical event of the next decade.[34] We are probably running towards the “net energy cliff” with a drop in the energy profitability of oil extraction and an energy famine in more and more sectors of society. So, in the post-peak oil world, oil extraction will not gradually decline, but a much faster decline.

Unlimited demand began to exceed

price

Historical oil production-EIA

85 88 91 94 97 00 03 06 09 12 15 18 21 24 27 30

Graph VIII: growing gap between oil demand and supply [“Historical oil production-EIA” “Historical oil production according to the IEA”; “Demand not constrained by lack of credit or high price” “Demand not constrained by lack of credit or high price”; “One estimate of future production” “One estimate of future production”; “Growing gap leads to financial distress; reduced consumption” “Growing gap leads to financial distress; reduced consumption”].

In general, there are two possible scenarios for the near future: (1) the continued worsening of the crisis, or continuation of the trends of the last 16 months towards the second Great Depression (the most likely scenario) and (2) a short recovery, especially in China and India, and then a sudden drop due to exploding prices and hyperinflation. Both scenarios lead to economic crisis due to the collapse of the economic bubble and massive bankruptcy and the inability of many states to pay their credits and debts. From a perspective that takes into account peak oil, the second scenario - recovery, price increase, contraction, price decrease, recovery, etc. - is perhaps the best. Most people only take peak oil seriously when oil prices go up, but when prices go down, they very wrongly believe that peak oil is irrelevant. Peak oil analysts used to predict, before the crisis escalated in 2008, that peak oil/energy would cause an economic contraction, that oil prices would fall, that there would be a short and partial recovery, that prices would rise again, that there would be a new contraction, etc. The contraction-recovery-contraction cycle would repeat itself, but each time at a deeper and more serious level. However, there is another scenario, which as of today (Spring 2010) seems to be more likely. It seems that the financial credit system - in super-indebted countries, such as the US, most European countries and Japan - can no longer be repaired and

²⁴ “Wilderness way” in the original. “Wilderness” is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as “wild nature”. Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

its subsequent implosion is inevitable due to the impossibility of restarting economic growth. Bailouts and "stimulus packages" may buy some time, but they will not prevent further contraction of the economy. The worsening of the crisis, with relatively low prices, will mask peak oil/energy - the most important event of our era - for a long time. In 2010, as protectionism and economic and social depression increase, many states will be pushed (some are already being pushed) to choose between three difficult options: (hyper)inflation, high taxes and reduction of public spending (with great increase in unemployment, serious social tensions, fall of governments, etc.) or default on their debt (ie bankruptcy). Bankruptcy – or the bursting of the bailout/debt bubble, "the mother of all bubbles"²⁵ – is probably inevitable for most countries. The crisis in Greece at the beginning of 2010 is only the beginning of this trend.

Mass discontent, strikes and street unrest are a very real possibility in the next couple of years, since without the constant supply of cheap (or not so expensive, as now) energy, big cities are powder kegs. The food crisis will be rampant, due to rising energy prices, lack of investment and bad weather. This will be the end, among other things, of the plural, liberal, democratic and multicultural society. In the age of cheap energy, the government can be relatively tolerant and various ethnic and religious groups can live together relatively peacefully. But in the era of scarcity and the growing economic and energy crisis, social tension will increase and governments will apply more repressive policies and more draconian measures: capital punishment, border closures and immigration bans, restrictions on civil liberties, etc. The constant increase in prices, unemployment and taxes will cause the impoverishment and disappearance of the middle classes. The ethnic majority will look for scapegoats and often these will be minorities (racial, ethnic, religious). Some of these measures - slight hints of future trends - can already be seen today.[36] Some peak oil thinkers, such as John M. Greer, predict so-called catabolic collapse or long-term processes of social disintegration over several centuries.²⁶ Most likely, it will take less time for this breakup to happen, several decades at most, mostly because of the perfect storm (more on that later) and the industrial economy's complete reliance on oil and other fossil fuels. . It is hard to believe that this is a long-term disintegration, such as the Roman Empire or the Classic Maya civilization.

Further into the future, from around 2025, we can expect a real disintegration of industrial societies and ever-accelerating processes of demographic (population decline) and social collapse (decrease in political, technological and economic complexity). [38] In 2030 world oil production will be half the level of 2008, but with around 8.5 billion

²⁵ "Wise-use movement" in the original. The "Wise Use" movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

²⁶ "Between villages there is a death zone" in the original. *N. from t.*

human beings; by no means a very rosy prospect. This is not catastrophism or the apocalypse, but a new case of the collapse of a complex society, a subject of frequent scientific study. The recent fall in oil prices, since the summer of 2008, will lead to a future supply crisis (physical scarcity of oil, perhaps in the next 3 or 4 years), since many prospecting and investment projects in oil fields are being cancelled. These cancellations increase the probability that the concrete peak of “production” -87.5 mb/d in July 2008- will never be surpassed. Economic activity may recover somewhat (as during the summer of 2009) in the short term due to government fiscal policies (bailouts, stimulus packages, etc.) but a real and long-term recovery cannot be achieved without the return of the era of cheap and abundant energy. Increasing geopolitical violence and hoarding policies (which prevent adequate exploration and “production” from being applied to resource reserves) will further decrease the amount of oil available on the world market in the future. Conflicts over remaining energy reserves will grow in the near future.²⁷ Globalization will be relegated to the dustbin of history and the great megacities - supposedly “too big to fail” - will collapse and disappear. In addition, most of the states will also disappear. After the collapse of the US empire there will be no other world hegemony - at most a short-term primacy of Russia, the only superpower with significant reserves of oil and natural gas. Overburdened by the growing deficit and rising energy prices, China will also collapse. But this collapse has to be understood as a gradual and long-term process, even if it is limited to only a few decades. Different regions will be affected in different ways, depending on demographic density, geopolitical environment, whether the social structure is ethnically/socially/religiously homogeneous or heterogeneous, level of industrialization, etc.

The end of the first phase of the fossil fuel era is of great importance to the human population.[40] From Neolithic domestication to the 18th century, the population increased, but very gradually and with many local and regional demographic crises. The world population was 800 million in 1800, 1.6 billion in 1900 and today it is 6.8 billion (see figure VII). The great increase in population in the last two centuries has been only to some extent a consequence of genetic engineering applied to food plants and the agricultural exploitation of new arable land. For the most part, it has been a consequence of fossil fuels, especially the use of oil in agriculture. The first industrial revolution in agriculture in the mid-nineteenth century, based on Peruvian guano and nitrogen phosphates (beginning of agricultural chemistry), made possible the great increase in the European population. Starting in 1950, the second industrial revolution in agriculture - the so-called green revolution (an ironic name, given the massive destruction of wild habitats it entailed) - caused a huge increase in food production and was completely dependent on the massive use of oil and cheap gas. Fertilizers, pesticides, and herbicides are made from oil and natural gas. Traditional non-industrial agriculture cannot support more than a billion people; probably much less. Much previously

²⁷ Aldo Leopold (1887-1948). American ecologist and conservationist. He had a great influence on conservation thought in the 20th century. *N. from t.*

arable land is (or will be) useless for agriculture due to climate change (desertification), water scarcity or poisoning with industrial chemicals.

Peak energy also means peak population, which will grow over the next few years, to around 7.5 billion, and then begin to fall, slowly or rapidly, depending on the circumstances. Without cheap energy, there will be no second “green revolution”. Conventional demographic forecasts - population rising to around 10 billion and then leveling off - are the wishful thinking of demographers, not the most likely trends. The only rational means to achieve population decline is to decrease food production (inevitable in any case), since an increase in the quantity of food is followed by an increase in population. However, an abrupt and violent demographic collapse in the 21st century, probably below one billion, or much less (below one hundred million in case of the worst scenario -thermonuclear war + pandemic diseases-), is the probable result. realistic view of the perfect storm: the convergence of fossil fuel depletion, climate change, and many other issues. Diseases, social violence (internal and external) and famines will be the main mechanisms of demographic collapse in the 21st century. Overpopulation and collapse become possible when a species finds a rich source of resources that promotes its reproduction, which in turn, after a certain period of time, causes that source to run out. In the context of peak oil, all aspirations to achieve an “American way of life” of the poor populations of the Third World countries (and also of the “developed” countries) will have to be abandoned forever, since neither the minority Rich will be able to sustain her profligate lifestyle for a long time. The end of global industrial civilization will mean, for a long time, the end of civilization as such. In recent history, the collapse of one civilization made possible the rise of some other complex society. But today there is no longer any unsettled territory[u] or empty space to allow such an emergence. Furthermore, the restoration of a complex agricultural civilization will not be possible because of the lack of fertile soil. Only in the distant future, after several centuries or more, may complex societies appear again, but industrial civilization will never be restored. It is/was something that will not happen again, as fossil fuels cannot be regenerated on a human time scale.

[u] “Frontier” in the original. Literally “border”. It refers to the way in which in English the area of the territory of a civilization that borders on territories not colonized by any civilization is called. *N. from t.*

Graph IX: increase in world population from the IX to the XXI century

Graph IXa: how many people can survive depending on a specific energy source

Peak oil and the energy crisis are the main topics of this article. There are many other difficulties (not problems) making the human situation particularly difficult, such as soil erosion, lack of water, new diseases, etc. but here we cannot write about them in detail. The most important is, of course, rapid climate change, probably largely man-made. Climate change theorists and activists typically ignore peak oil or, ironically, welcome it as a spur to a faster exit from the fossil fuel economy (as if that were even possible). Climate change is talked about a lot in public, in the mass media and even in political circles – perhaps because it is an external threat, appropriate

for technocratic “problem-solution” thinking. However, the impact of climate change is slower, and industrial societies could perhaps adapt if unlimited amounts of cheap energy were available. The consequences of climate change will probably only be devastating if combined with the end of the fossil fuel era. Peak oil, which is based on solid geological facts, is internal (ie it threatens the foundations of the normal functioning of industrial societies) and therefore constitutes a much greater threat than climate change.²⁸

Peak oil and climate change are two fundamental parts of the perfect storm and must be considered together - not separately, as is often the case - as the probable cause of demographic and social collapse in the 21st century. But both do not have the same importance, contrary to what many writers and analysts think.[42] As Kjell Aleklett and various peak oil analysts have pointed out, the IGC’s dominant scenarios are unrealistic because they ignore the issue of peak oil.²⁹ These scenarios assume that business as usual will continue and that the increase in the extraction and consumption of fossil fuels will continue.[44] But in view of peak oil and energy, this is a wrong assumption and even the most catastrophic scenarios are unrealistic. The likely collapse of industrial civilization in the 21st century will be due to a lack of net energy, not the absence of a stable climate. Industrial societies will collapse long before the worst consequences of climate change become apparent. The contemporary mega-crisis and the shaking of the foundations of the world economy in 2008 and 2009 have nothing to do with climate change but are (almost) entirely due to the factor of energy or peak oil. In political circles and by the public, too much importance is being given to the phenomenon of climate change and downplaying peak energy. Kurt Cobb has given two reasons for this: first, governments can hide the real data about oil reserves but not about the weather, and second, oil is deep underground, hard to measure, and its extraction depends on political, financial, technological and other factors.³⁰

A systematic approach to resource management and slow population reduction would certainly be the most desirable option. The gradual decline of production, consumption, technology, population and cities should be the top priority of governments and the public. Instead of suppressing the symptoms, our priority should be the elimination of the deep causes of the plight in which the human being finds himself.

However, this is not a realistic option, since human beings are hardly capable of working with a global and long-term vision. Worse still, the most rational option is in

²⁸ 1 mile is approximately 1.6 km. *N. from t.*

²⁹ In this regard, see also the presentation of “There where man is a visitor” by Dave Foreman in *Indomitable Nature*: [<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitante>][<http://www.naturalezaindomita.com/textos/naturaleza-salvaje-y-teora-ecocntrica/all-donde-el-hombre-es-un-visitor>].

³⁰ “Wilderness” in the original. This term refers to lands and ecosystems that are little or not at all humanized. Depending on the context, it can be translated in various ways: “wild lands”, “wild territories”, “wild areas”, “wild ecosystems” or, more generally, “wild nature”. In this text it has been translated as “wild nature” except in cases where it is explicitly indicated otherwise. *N. of t.*

direct opposition to the fundamental ideological values of the modern world: faith in technological miracles and in the goodness of technological and demographic expansion, faith in "historical progress" ("we cannot go back"), humanistic prejudices about "human rights", etc. The difficult situation in which we find ourselves is and will be interpreted, both by the government and by the public, as a mere "problem" for which to seek some (technological) "solution". But even human self-deception has a limit.

Various responses have been/are developed as the social and ecological crisis of industrial civilization has been/is increasing. There is one such response that deserves to be mentioned here: the so-called Transition Cities[v] (TCM) movement in Britain, New Zealand, the US and several other countries. This movement contains programs and preparations for the coming energy shortages and climate change. Its main objective is deglobalization and localization[w], especially with regard to energy security and food production. Its central idea is that a city, town or other small area can make the energy and food transition to a post-oil world through the efforts of local people, without depending on big governments or big business. Particular emphasis is placed on permaculture and other local ways of life. Citizens of Transition Cities should, in theory, live in complete self-sufficiency and make use of the local infrastructure for agriculture, clothing, metallurgy, and other basic aspects of their lives.³¹ The MCT is, so far, the best practical and constructive approach to the present situation and rightly attempts to connect peak oil with climate change. A great value of the MCT is its community-based approach. Human beings are social animals and will certainly live in some kind of societies after the collapse of industrial civilization, not isolated like Robinson Crusoe, with an arsenal of weapons and 10 acres[517][518]³² of land.³³ But this transition must be understood in the context of demographic and social collapse (during the collapse), not as a means of avoiding it (against the collapse). Otherwise, it will be one more case of unwarranted optimism by certain members of the middle class who firmly believe that the future "will be what we want it to be." Hopkins personally thinks that future energy descent and more local living will be inevitable, but the MCT includes many people with more reformist convictions. This reformist orientation may be, as Trainer argues, dominant at present, but future disintegrative tendencies will certainly increase more radical options. In the MCT there is a general conviction that alternative (renewable) energy sources are possible "solutions" to dependence on fossil fuels and climate change, but, as we have already seen, this is not correct. For many of the MCT members, the "transition" is towards a reformed industrial society, based on new (renewable) energies and with a somewhat smaller (but still very complex) tech-

³¹ "Wilderness" in the original. *N. of t.*

³² An acre is equal to about 0.4 hectares. *N. from t.*

³³ "Wildness" in the original. It normally refers to the wild character, to the quality of being wild, to what certain beings and entities have as wild. Although, sometimes, depending on the context, it can be freely translated as simply "wild nature". Here, except where otherwise noted, it has been translated as "the wild character." *N. of t.*

nological scale. In any case, the MCT is an example of how the concept of industrial collapse should not imply pessimism or nihilistic catastrophism[y].

On the contrary, it can and should be a call for the constructive disintegration of the industrial megastructure and the affirmation of local communities as the new/old human social context. The subjective reformist convictions of most of its members are not crucial since the objective processes of social and demographic disintegration will force people to adapt to the new circumstances. They currently fall into the light green[z] spectrum but that could change very quickly.

Peak oil theorists and activists have often been and are accused of having a gloomy view of the human future. This view is often reinforced by his initially positive thinking about industrial society. That is, the vast majority of those who care about peak oil believe that contemporary industrial civilization - at least in its present form - is unsustainable and that a collapse or reduction in population and complexity and technological/political, is unavoidable in the near future. But, at the same time, many of them, especially certain retired geologists (Campbell, Deffeyes and others), also believe in many aspects of the official ideology of industrial society: in the myth of "historical progress", in civilization as "ascent and achievement", in the industrial order as a "pinnacle of progress", in liberal democracy as a society of freedom and prosperity, etc.³⁴ This interpretation is not only incorrect - I have written about the reasons for this elsewhere³⁵ - but it creates additional dilemmas. By accepting this ideology they unnecessarily weaken their own argument. If people firmly believe in the official ideology of industrialism (consumerism=well-being, technological expansion=progress, medicine=health, state=security, etc.), they will probably go to great lengths to uphold it and ignore, until the last moment, all warnings. about its unsustainability. If people believe that industrial society is something "advanced" and that it is part of "progressive cultural evolution[aa]", they will fight hard to maintain it. But if we question this ideology and understand that history is not progressive and that industrial society is the most unnatural[bb] social order in human history, its collapse will seem not only inevitable but desirable. The crucial question is not: can we sustain this civilization (or civilization itself), but: should we even try? Certainly there will be mass mortality, much suffering and much destruction among human beings, but the collapse of industrial civilization should not be understood as a tragedy or a

z "Light-green" in the original. Literally "light green". The author is perhaps referring to the so-called "light-green environmentalism" ("light green environmentalism") a branch of environmentalism based on personal responsibility and change in lifestyle. Although, given the context, he could rather be referring to the so-called "bright-green environmentalism", which is based on the belief that technological change and social

³⁴ *Raphus cucullatus*. Bird, extinct in the 17th century, which inhabited the Mauritius Islands, in the Indian Ocean. It is one of the most famous examples of extinction of a species caused by humans. *N. of t.*

³⁵ "Wilderness" in the original. *N. of t.*

innovation constitute the most appropriate way to achieve sustainable development. See, for example, the entry “Bright green environmentalism” on Wikipedia:

[https://en.wikipedia.org/wiki/Bright_green_environmentalism%23Origin_and_evolution_of_/en.wikipedia.org/wiki/Bright_green_environmentalism#Origin_and_evolution_of_bright_gre][https://en.wikipedia.org/wiki/Bright_green_environmentalism%23Origin_and_evolution_of_thinking.] *N. from t.*

[aa] “Progressive” in the original. “Progressive” in English can mean “progressive” or “progressive”. In this text it has been considered by the context (and by other texts of the author) that the correct translation is “progressive”, in the sense of “in accordance with progress”. *N. from t.*

[bb] “Unnatural in the original”. In English “unnatural” can mean either “unnatural” (not natural) or “unnatural” (contrary to natural). It has been considered that the correct translation here is “unnatural”. *N. from t.* disaster. It will be an opportunity to rebuild small communities, more suitable for human animals and more suitable for human nature.³⁶ Some human groups may be able to recover hunter-gatherer life, our natural evolutionary context.³⁷ Demographic and social collapse will save many ecosystems and species from man-made destruction. The collapse of industrial civilization will not be a catastrophe or the end of the world, or even the end of the human species, but just one more case of the collapse of a complex society, a frequent phenomenon in recent human history.³⁸ The collapse of civilization does not imply a fall into some kind of primordial chaos, but rather a return to more typical/normal living conditions in human history. Demographic and social collapse will relax massive human pressure on wild habitats and species and make possible, in the long term, the restoration of many aspects of the wild natural world, our true home. We have a good chance of avoiding repeating the typical anthropogenic problems of traditional agricultural societies - small local wars, contagious diseases, great inequalities, etc. - since the restoration of agricultural civilizations will not be possible in the near future. There are no favorable ecological conditions (“uncolonized territories”[cc] or empty space, possibility of intensive agriculture, etc.) for the growth of some other complex societies

³⁶ “Rambunctious garden” in the original. It is an allusion to *Rambunctious Garden* which, as the author points out below, is the title of a book by Marris in which he defends the domestication and management of the Biosphere. *N. of t.*

³⁷ “Breakthrough Institute” in the original. *N. of t.*

³⁸ “Think tank” in the original. Think tanks are usually organizations made up of multidisciplinary theorists and intellectuals who express their opinions on[https://es.wikipedia.org/wiki/Pol%3%adtica_social][social policy,][https://es.wikipedia.org/wiki/Estrategia_pol%3%adtica][political strategy,][https://es.wikipedia.org/wiki/Econom%3%ada][economic]o[https://es.wikipedia.org/wiki/Militar][military,][https://es.wikipedia.org/wiki/Tecnolog%3%ada][technology]o[https://es.wikipedia.org/wiki/Cultura][culture].]They are characterized by having some kind of ideological [https://es.wikipedia.org/wiki/Ideol%3%b3gica][n] orientation and are often related to military laboratories, private companies and academic or research institutions. another type. His works usually have an important weight in politics and public opinion, particularly in the United States. *N. from t.*

when the industrial civilization falls. The MCT can be a good start for our uncertain post-industrial future.

GRADES:

1. Last update of the article: June 18, 2010.

2. In modern physics, energy is normally understood as the ability to do work. On Earth, virtually all available energy comes from the Sun, including fossil fuels (oil, natural gas, and coal). Some experts have defended, in recent years, the so-called abiotic theory of petroleum - which holds that there are limitless reserves of liquid primordial hydrocarbons deep within the Earth that are continually being replenished by abiotic processes - but this is a very little opinion, probable and very rare (Heinberg 2004b). About energy in the history of human societies, see: Smil 1994, 2003, Price 1995, Heinberg 2005, Crosby 2006, Ruddiman 2007, Pimentel-Pimentel 2008 and Markus 2009b.

3. On liberalism, Marxism, and other modern ideologies and their ecological implications, see: Hay 2002, Sunderlin 2003, Dryzek 2005, Barry 2007, and Dobson 2007.

4. Some contemporary analysts have warned that modern demographic theories constantly overlook the role played by the energy factor -including fossil fuels- in population growth (Zable 2002, Pimental 2008 and Chefurka 2009).

5. This process was not rapid but very gradual. Globally, the 19th century was still the age of wood and in the 20th century coal was (and still is today) the main source of energy, with oil being a secondary source. Furthermore, the rate of

See footnote k in this same article. *N. t.* Coal extraction will increase in the near future as oil extraction stalls at the *peak plateau*. On the history of oil exploitation and fossil fuels in general, see: Catton 1980, Smil 1994, Youngquist 1997, Heinberg 2005, Klare 2005, Duncan 2006, Kunstler 2006, Dekanic 2007, Greer 2008a, and Yergin 2008.

6. All graphics can be found at:[<http://www.wikipedia.org/>][www.wikipedia.org]and at

[<http://www.energybulletin.net/dd/>][www.energybulletin.net/dd]

7. Quotation marks mean that there is no such thing as “oil production” (or gas, or coal). Like air or water, fossil fuels cannot be produced, they can only be found, extracted and transformed into their different industrial derivatives. We can talk about the “production” of electrical energy or machines but not about the production of fossil fuels. As many writers in peak oil debate circles have pointed out, the correct word is not “production” but “extraction”.

8. About Hubbert and his original analysis see: Heinberg 2005 and Deffeyes 2008 (see also figure IV). William Catton was the first author to warn, in a lengthy analysis, that fossil fuels are the Achilles heel of industrial societies (Catton 1980).

9. Campbell and Laherrere published the famous article “The End of Cheap Oil?” (*Scientific American*, March 1998[ee]), when the price of oil was very low, between 10

and 12 d/b. His main conclusion – that the era of cheap energy would end very soon and abruptly, probably before 2010 – was ridiculed or, in the popular press, completely ignored.

10. Here “peak oil” refers to the absolute maximum amount of oil extracted, but it can also mean the maximum amount of oil extracted per capita. In this second sense, the oil peak occurred around 1990 (4.5 barrels per capita).

11. There is a general opinion in the public that market speculation is the main cause of the increase in the price of oil. This may be true - both for the increase and for the decrease - but speculation always has a basis, that is, it is based on the relationship between demand and production. If oil extraction is more or less stagnant, as it has been in recent years, then the expectation of increased demand will cause prices to rise rapidly. That was the case in 2007 and 2008, and again in the summer-autumn of 2009, with the first signs of economic recovery. Also, there are hoarding policies and a lot of violence in some oil-rich countries (Nigeria, Iraq) that prevent exploration and extraction, but this is possible only because there is a limited amount of oil. In an ideal world - with maximum investment and international cooperation and no hoarding or violence - the rate of extraction could be significantly higher, but that would be 80, 100 or 150 d/b oil, something the economy cannot tolerate. for a long time, and it would be of *low quality*. and those prices

[dd] *web* page currently inaccessible (2020). *N. from t.*

[ee] There is a Spanish translation: The end of the era of cheap oil” in Investigación y Ciencia, May 1998. *N. t.* highs should remain stable for about ten years - investors do not like volatile prices - but this does not exist either.

12. There is an opinion that the 2008 production numbers were inflated, and that the May 2005 record (85 million barrels) is the historical record, which has never been exceeded (and probably never will be). . However, there is also a difference between the peak of oil (2005) and the peak of all liquid fuels (2008).

13. There is some uncertainty here as the exact data on world (extractable) oil reserves is not known. Saudi Arabia and other OPEC countries do not want to reveal all the data concerned, considering it a top state secret. But the stagnation of world oil extraction between 2005 and 2008 can be understood as indirect evidence of the recurring claim that official OPEC data is inflated or exaggerated. There is no reason, if the data offered is correct, for OPEC not to repeat the same strategy of the 1980s: significant increase in extraction, flooding the market with cheap oil, declining prices and... *voilà*, there is no more crisis. The events of the second half of 2008 have shown that a large and rapid increase in prices is dangerous not only for oil importers but also for oil exporters. In this article the terms peak oil and peak energy are used interchangeably.

14. For a good analysis, see Rubin 2009.

15. Analogies and comparisons are often made between the Great Depression and the current crisis, but the similarities are superficial and the differences are much more important. The Great Depression had nothing to do with energy prices, in fact, then

oil prices in the US and other developed countries were very low (the discovery of peak oil in the US occurred precisely in the 1930s). It was mainly caused, like most crises of the capitalist economy before it, by overproduction and underconsumption. Subsequent crises, including the three oil crises (1973, 1979 and 2007-2008), were mainly caused by rising energy prices. The situation today is quite different and much more difficult to resolve. The contemporary crisis has been caused mainly by peak oil (or, more correctly, peak energy) which is part of the process of ending the fossil fuel era, combined with climate change and many other "minor" problems. So neo-Keynesianism won't do much good.

16. Heinberg 2010b.

17. The obsession with "growth" is not a subjective error -as many adherents of "steady state economics" or "living within limits" think- it is the objective consequence of an economic system based on debts and credits rotary. Without "growth" old credits and debts cannot be paid, banks fail, unemployment grows rapidly and the entire system begins to crumble. Massive state interventions may temporarily slow down this process, but without the return of cheap energy, they will not be able to restore the old economy.

18. Mills 2008 and Yergin 2008. We will discuss the details of the peak oil ff debate in a separate essay.[ff]

19. It is true that there were some significant discoveries in 2007 and 2008 in deep waters (the coast of Brazil, the Gulf of Mexico) and in other places that are difficult to access (and there will also be other discoveries in the future), since high oil prices oil make prospecting make sense. But it will take 7-10 years of massive investment and a stable oil price - not too low (investment collapse) and not too high (economy collapse), 70 or 80 d/b - to start extraction. This is not a realistic prospect considering the worsening economic crisis (large overspending and budget deficits in the more "developed" states) and the great volatility of oil prices in recent years. Where will the money needed to invest in future oil extraction come from? The EROEI will be much smaller since the new deposits are less accessible than the older ones. If "production" were to start at some point, only small amounts of oil would be extracted, roughly 15-20%, as of 2016. Meanwhile, the giant old oil fields, which generate about 70% of world "production", will fall to 40% or 50%. Therefore, there is no room for the enthusiasm about "new discoveries" so often present in the news of the mass media. These discoveries only confirm the central thesis of peak oil: human beings have already extracted and consumed about half of the existing oil, the most easily obtainable and of the best quality. If there really were vast amounts of oil worldwide, as critics of the peak oil thesis argue, one would expect the rate of discoveries in the last 5 or 6 years to have been much higher than it has been. Much confusion is also caused by not distinguishing between resources (estimated total amount of oil in the field) and reserves (extractable portion under current operating conditions). After peak oil, only a small part of the resources are actually reserves and can be extracted.

For the sake of convenience, I am keeping here the usual anthropocentric talk about "resources", "reserves", etc., but my sympathy is with the radical ecocentric philosophy, which recognizes the intrinsic value of wilderness and nature. the other species.

20. There are many short but good analyzes of economic myopia in peak oil circles (eg, Hanson 1999, Heinberg 2008, Rubin 2009, and Lardelli 2009c).

21. In November 2009, two "informants" (anonymous sources within the Agency) confirmed these claims. This is the first *internal* acknowledgment that governments have been intentionally overestimating the amount of oil we have and can extract from the ground. Of course, this news is not new to anyone familiar with the subject of peak oil. In fact, claims of this sort have often been made by many peak oil theorists in recent years. The IEA is not a neutral institution that pursues scientific objectivity,

[ff] The author died shortly after writing this article (2010). This translator does not know if such an essay exists. N. but rather an institution created and sponsored by Western governments, established in 1974 as a quasi-political body to prevent another oil crisis, monitor and study the world oil market, and safeguard the oil supply for the West. He always had to say what Western governments (especially the US) wanted to hear. And there are other problems with the IEA (and similar institutions such as the US Department of Energy) now including all liquid fuels, including ethanol and synthetic fuels, under "oil production", obviously to increase profits. production figures.

22. On this, see Klare 2005 and 2009.

23. Obama is the first non-white president of the US and for many his election was a protest against the policies of the Bush regime. But in 2009 it really changed and the old policies (domestic and foreign) have continued until today (see Cohen 2009). Obama's policies have been (and continue to be) a mere extension of the old belated and failed policies of Bush, which attempt to restore some fragments of the old economy. This is not Obama's fault as he is part of the system (especially Wall Street's "too big to fail" banks) and, in the world of peak oil, the system can no longer function normally. People are more or less insignificant. Obama's obsession with health care reform is another symptom of his complete misunderstanding of the situation by focusing on petty problems. The health care system - or, more correctly, the medicalized society and industrial medicine - is a typical product of the era of cheap energy that cannot be maintained - much less expanded - now that this era has come to an end. finish. Obama's program for the massive development of "alternatives" - an unrealistic goal in any case - is a consequence of climate change and the US's "energy independence" from foreign oil, not an awareness of the serious energy situation.

24. For example, see Huber 2004, Frazier 2004, Hawken 2007 and 2008, Pernick and Wilder 2008, Friedman 2008, and Nordhaus and Shellenberg 2009. These authors think that talking about natural limits is counterproductive and superfluous, since there are enormous resources and the only problem is the lack of appropriate technology and investments. It is certainly not ideologically correct to talk about peak oil and other ecological limits in industrial societies, even in the post-peak oil era.

25. Korpela 2008.

26. Many authors have written about the problems of “alternatives”. See: Catton 1980, Youngquist 1999 and 2000, Goodstein 2005, Heinberg 2005 and 2009c, Kunstler 2006, Homer-Dixon 2006, Greer 2008a, Holmgren 2009, and Hall and Day 2009. There is some faith in peak oil debate circles. Limited in that some mix of sustainable energy, with primacy of “renewables”, will be possible in the distant future (for example, Leggett 2006, Klare 2006, 2009b and Heinberg 2009c), but generally there is not much enthusiasm about it. Dark warnings about a painful energy transition, with probable mass die-off, are much more common and are the main reason such circles are regularly accused of “catastrophizing”[gg].

27. For different perspectives on nuclear power, see: Goodstein 2005, Mahaffey 2009, and Cooke 2009. Proponents of nuclear power—James Lovelock, the “father” of the Gaia theory, is probably most famous—often argue that it does not contribute to climate change or pollution. But this is true if we consider exclusively the nuclear chain reaction, which does not produce carbon dioxide or other greenhouse gases. All other activities (mining and refining of uranium ore, transporting it, construction of nuclear power plants, etc.), necessary to obtain nuclear energy, produce enormous amounts of carbon dioxide and environmental pollution and they are very expensive. And there are other big problems, from waste to the proliferation of nuclear weapons. For example, the very ones who want to ban Iran’s nuclear program are themselves ardent believers in nuclear power (although, of course, they are enlightened, democratic and peaceful leaders, not fanatical theocratic mullahs...).

28. On coal see Heinberg 2009a. Heinberg - and some other analysts and institutions (such as the German Energy Watch Group -) predict the peak of coal within the next 15 or 20 years, perhaps even sooner, depending on its use as a substitute for dwindling oil and gas reserves. Some experts question Heinberg’s analysis and think that the extractable amounts of carbon are much higher, but they usually ignore the core problem of peak oil. Another problem with coal is that we don’t live in the 19th century with a billion or so human beings whose The great majority were traditional peasants (not yet included in the industrial order).

29. The hypothesis about so-called abiogenic oil - that oil is continually created and replenished in the Earth’s mantle by non-organic processes - was often mentioned several years ago. But it is probably scientifically incorrect and of no practical consequence. Natural replenishment cannot compensate for human extraction (Heinberg 2004b).

30. For a good discussion of the economic situation from a peak oil perspective, see: Rubin 2009, Heinberg 2009b, and Tverberg 2009a and b.

31. Some economists and analysts defending eternal growth find a “solution” in the “peak demand” in rich countries. But the peak in demand means the end of growth, and will not allow us to escape from a permanent crisis that is continually worsening. The peak in demand is only a consequence of the energy peak, that is, the intolerable increase in energy prices. The peak demand thesis - and the previously mentioned *peak plateau* - are the last line of defense for peak energy deniers. As M. Lardelli appropri-

ately puts it, this is nothing more than a hoax to disguise the fact that dwindling oil supplies have killed economic growth in the “developed” world (Lardelli 2009b).

[gg] ”Doomesterism” in the original. See footnote n of this article. *N. from t.*

32. Since 2009, CERA maintains that the *peak plateau* will last several decades, but this is probably yet another incorrect prediction. Considering the basic factors - rate of depletion of old oil fields, low rate of discovery of new fields, increase in oil consumption in oil-exporting countries, cancellation of many unconventional oil extraction mega-projects, etc. - it is realistic argue that the plateau of the peak will not last more than 5 or 10 years, even if the West plunges fully into a second Great Depression. Of course, any increase in consumption in the West - a symptom of ”recovery” - will shorten the duration of the plateau. But even if the CERA forecast is correct, it will not be of much help to Western oil-importing countries because of the growing net export crisis. Oil-producing countries are consuming more and more oil and there is less and less oil for the international market.

33. For good analysis of this, see: Kunstler 2006, Greer 2008, Rubin 2009 and other writers dealing with peak oil.

34. Rubin 2009, Chefurka 2009, and Heinberg 2009a and 2009c.

35. Marshall 2009a. Marshall - while lacking insight into peak oil and the connection between energy and the economy - points out that the massive stimulus packages were only delaying the inevitable (economic collapse and the Great Depression), making this going to be much worse. when the debt bubble bursts. The so-called economic recovery is just an illusion, existing only for the financial speculations of the stock market. This time the Keynesian economists will be wrong, since government spending and easy credit are not the way out (Marshall 2009a and 2009b.) This is of course true, but the real reason is that the era of cheap energy It’s over, forever. However, in the classical theory of Keynes, public spending did not mean an increase in the state deficit and public debt, contrary to what happens in contemporary practice, since Keynes lived in the era of cheap and abundant energy.

36. Several years ago, the demographer William Stanton predicted the death of multiculturalism and liberal regimes due to the advent of the era of energy scarcity and depletion (Stanton 2003). Not surprisingly, he came under fire from both the right and left as his Malthusian claims - immigration ban, every woman has the right to have only one (healthy) child, compulsory infanticide of deformed children, legalization of voluntary euthanasia and mandatory forced euthanasia for terminally ill patients - are not only politically incorrect, but anathema to liberals, leftists, Christians and other humanists. But in the post-peak oil era of increasing scarcity and social tensions, these proposals will sound quite reasonable, and their opponents will be treated like lunatics.

37. Greer 2008. There are also many excellent articles by Greer on the Internet.

38. For the different approaches and visions of the future, see: Price 1995, Smith, Lyons and Moore 2000, Cocks 2003, Heinberg 2004, 2009b and 2009c, Kunstler 2006, Greer 2008a, 2009 and Holmgren 2009. Many survivalist books, often in novel form, about survival during the gradual collapse of industrial civilization, have been pub-

lished in recent years (eg Kunstler 2008 and Rawles 2009). We can talk about the most likely trends in the near future, although the situation may change, for example with sudden discoveries of many easy-to-extract oil and gas deposits (very unlikely, but possible).

39. On energy and geopolitics, see: Homer-Dixon 2001, 2006 and 2009, Heinberg 2004a and Klare 2005 and 2009a.

40. Except for a few brave thinkers, like P. Erhlich and G. Hardin, there was a long silence, in ecological circles and the like, about the population explosion after 1945. This has slowly changed in recent years and many thinkers and activists openly regard population as a problem, emphasize that the population explosion was and is a big (probably the biggest) problem, and/or argue for population reduction (Catton 1980, 1998 and 2009, Youngquist 1999, Smail 2002 and 2008, Stanton 2003, Sunderlin 2003, Heinberg 2004a and 2007, Linner and Ola 2004, McKee 2005, Pimentel 2008, Hall and Day 2009, McKillop 2009 and Lardelli 2009a). Of course, their respective concrete propositions are very different. Michael Lardelli thinks that overpopulated poor countries are the real enemies of human survival, since hitting ecological limits is much harder if the population is large. Population growth cannot be stopped and reversed as fast as economic growth (Lardelli 2008 and 2009a).

41. As recent experiences show, only very high oil prices, above 100 d/b, can make the discourse about peak oil visible in the mass media and political circles. Otherwise, silence prevails not only because talking about absolute ecological limits is wrong, but simply because politicians have no plan for the energy crisis. If you don't know what to do about peak oil, don't mention it at all. However, the extent to which governments understand the issue of peak oil remains a mystery. Oil depletion was a major issue for the US administration from 1998 onwards, especially after 2001 (see: Klare 2005). The main objective of the US occupation of Iraq in 2003 was the control of its large oil reserves. There were some early official warnings - such as Robert Hirsch's famous 2005 report for the US Department of Energy, "Peaking of World Oil Production" - but with no lasting effects. The governments of some smaller countries (Ireland, New Zealand) dormantly created commissions to deal with the issue of peak oil in 2007 and 2008, but this attempt was abandoned after the drop in oil prices. This silence will probably be broken in the next few years, after oil prices start to rise exponentially and governments are no longer advocates of the *status quo*, simply because there will no longer be any *status quo* to defend. Even the arch-defenders of the industrial society, such as the IEA, already recognize that the traditional way of life is "patently unsustainable" (*World Energy Outlook* 2008). The IEA had argued, in the 2007 report, that world oil reserves would be sufficient to meet growth in demand until 2030. In the 2008 (and 2009) report, peak oil is forecast for 2020 and a rate decline in oilfield product of 6.7%, not 3.7% as in the 2007 report. But for governments and the public this was only a small technical change in the numbers - if even they realized it.

42. Heinberg 2007 and 2009[a] and Holmgren 2009. Heinberg admits that the energy factor and peak oil are the fundamental threat today, but believes that technological

innovation can make future coal and oil extraction profitable. unconventional with catastrophic climatic effects (Heinberg 2009a:113-127). We do not believe so, since the worsening of the economic and social crisis, in the near future, will cripple the economy and make large extraction efforts impossible. Technological innovations are possible if there is a stable and growing economy, abundant cheap energy and a normal operation of the industrial megastructure, but this situation no longer exists. And Heinberg emphasizes that, due to limits on coal (and fossil fuel) supplies, the worst-case scenarios for climate change will not happen (Heinberg 2009a: 146). Heinberg has appropriately criticized the leaders of the December 2009 Copenhagen summit for living in a fantasy world, for making no mention of the peak oil and energy crisis, and for their faith in eternal growth and global urbanization (Heinberg 2010a).

43. Aleklett and Campbell 2003, Aleklett 2007 and 2010. We cannot talk here in detail about the cause(s) of climate change. There is a large minority of “skeptics” among climate scientists who do not deny that climate change is real, but who question the hypothesis that it is anthropic in nature and that the use of fossil fuels is a crucial factor. For our position, this is not particularly relevant since peak energy is a much more significant dilemma than climate change.

44. Recently, several short climatological papers have attempted to include peak oil issues (for example, Lynas 2008 and Kharecha and Hansen 2008; for a review see: Bardi 2009) but think that coal will be used as a substitute for decreasing supply of oil and gas. This is a problematic position, since the peak of oil and all liquid fuels means the beginning of the great crisis of industrial civilization, as we have seen in the last 2 or 3 years. Many projects for the extraction of coal and unconventional oil had to be canceled due to lack of capital and falling prices. The increasing disintegration of the industrial infrastructure in the near future will make the normal extraction of coal (and other substitutes) even more difficult. For a good discussion of this, see: Heinberg 2009a.

45. Cobb 2006.

46. The British Rob Hopkins, probably the most notorious MCT person, recently wrote a manual (Hopkins 2008) containing analyzes of different aspects of the future energy transition and relocation[hh]. There are various friendly criticisms of different aspects of this movement, from its showing too much optimism (Greer 2008) to its limited questioning of middle-class consumer culture and capitalism in general (Trainer 2009a, b and c). Nevertheless,

[hh] See footnote j, in this same translation. N. There are also other critics, who say that the MCT is too radical, and that it pays too much attention to collapse (Steffen 2009), although this is not a valid description of the majority of MCT participants. Peter Goodchild’s critique is much sharper, positing that the MCT is a kind of middle-class sideshow that ignores the sheer enormity of the plight of human beings (Goodchild 2010). This is probably true, given the prevailing middle-class optimism in the MCT, but the transition to a post-industrial future has to start somewhere.

47. This community-based approach is emphasized by other peak oil analysts, such as John M. Greer, Guy McPherson, Richard Heinberg, and many others. Obviously, the "movement" of peak oil -if this is a correct label- is not simple "catastrophism", nor even "survivalism" as its detractors think.

48. Typical of this approach is the well-known book *The Long Emergency* by James Kunstler with its defense of the "civilization project". Many other members of the peak oil community also accept the official ideology of industrial society, although, of course, without believing in its sustainability. "Save civilization" is also a typical slogan of climate change theorists. However, there is also some ambiguity in many peak oil writers who believe that the collapse of the industrial mega-structure and the restoration of small communities will have positive consequences. The writings of Richard Heinberg are typical of this approach (Heinberg 2004a, 2005, and 2007). Richard Heinberg, one of the most prominent thinkers on peak oil, was a radical critic not only of industrialism, but of civilization as a whole in the 1990s (Heinberg 1995 and 1996). But, in recent years, Heinberg has significantly changed his mind and is now ambivalent about the "benefits" of the industrial order, although there are also many occasional "primitivist" comments in his recent articles and essays. For many peak oil thinkers, the fundamental questioning of civilization and "progress" is completely unthinkable. Chuck Burr is an exception within peak oil circles with his critique of "historical progress" and civilization (Burr 2008). It is therefore quite incorrect to label peak oil thinkers as "neo-Luddites" or "anti-progressives" (Mills 2008).

49. Markus 2006, 2009a, 2009b, and 2009c.

50. This point is often emphasized in the writings of Greer, Heinberg, Kunstler, Baker, and other members of the humanist "current" within the Peak Oil movement. Certainly there is a positive aspect, not just pessimism, in the vision of the future of his writings.

51. For millions of years our ancestors were living not in the "Stone Age" (or in R. Duncan's "Olduvai Gorge"), but in the Green Age, or in the natural wild world, a clean and clean environment. organic; not in some kind of paradise, but in the normal social and ecological circumstances for which we are genetically adapted. Seen from the perspective of the quality of human life (that is, satisfaction of fundamental needs: community, own territory³⁹, equality, clean and wild environment, etc.) civilization has turned out to be a very bad experiment and it has always been a Dark Age. Therefore, reducing social complexity would not be such a bad thing at all.

52. For previous cases of collapse, see: Caldararo 2004, Homer and Dixon 2006, Tainter 2007, Ponting 2007, Diamond 2008, and McAnany and Yoffee 2009. This type of literature often overlooks the concrete situation of industrial societies and their complete dependence on new energy sources (fossil fuels). Overpopulation and collapse - that is, the reduction of population density and social complexity - were a possibility in the agrarian world, but are inevitable (or so it seems today) in the industrial world

³⁹ "Homeland" in the original. *N. from t.*

due to its reliance on renewable sources. non-renewable energy. This crucial fact was rightly emphasized by William Catton thirty years ago (Catton 1980). This means that the collapse of industrial civilization will be much faster - several decades at most - than the previous ones.

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THE WORLD UNTIL YESTERDAY OF JARED DIAMOND

by BR

In September of last year [2013], *The world until yesterday*¹ was published in Spanish, a book in which Jared Diamond answers the question “what can we learn from traditional societies?”.

Eight years ago, reading your book *Guns, Germs and Steel*² helped me better understand the development and functioning of complex human societies. For me it is the best summary of the history of human societies from a materialistic approach and, furthermore, the way it is written is pleasant and clear. For this reason, since then, I have recommended many people to read it. So, when I found out about the publication of your new book, I began to read it with interest.

In *The World Until Yesterday*, Diamond compares what he calls “traditional societies”³ (“ST” from now on) with the techno-industrial society⁴ (“STI”) through different aspects of human cultures such as possession of territory (pp. 55-79), trade (pp. 79-100), conflict resolution (pp. 101-206), parenting (pp. 207-246), the treatment of the elderly (pp. 247-282), the assumption and management of danger (pp. 283-376), religion (pp. 377-428), multilingualism (pp. 429-473) and the health (pp. 474-526). Through these comparisons, the book aims to draw lessons about what characteristics of TS we should, according to the author, adopt in the techno-industrial society.

After more than 500 pages of sociological comparisons and anthropological data, the conclusions Diamond reaches are surprisingly superficial. Your response to “what can we learn from traditional societies?” It includes, among other similar things, leading

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity*.

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

a healthier lifestyle and diet, playing sports and reducing the consumption of salt and sugar; raising our children in a bilingual or multilingual environment, avoiding physical punishment, sleeping with them as babies and weaning them late; be alert and take steps to reduce hazards while driving, going downstairs, or showering; eliminate compulsory retirement, encourage older people to lead a more active life; etc.

Despite this, *The world until yesterday* can provide information and reflections of interest⁵, although there would be many things to discuss and qualify⁶.

However, I will focus on what I think are the most general and important aspects.

At the base of Diamond's analysis are two fundamental questions:

1. That the "general trends" that explain cultural diversity are determined by "the number and density of the population, the means of obtaining food and the environment" (p. 37). That is to say that, although there are aspects of culture that are not determined by material bases, the basic and general characteristics depend on the population, the economy, technology and ecology. Diamond mentions the example of political centralization several times: "large populations [over 10,000 inhabitants] cannot function without leaders who make the decisions, without executives who put them into practice and without bureaucrats who administer the resolutions and laws. Unfortunately for readers who are anarchists and dream of living without a state government, these are the reasons why their dreams are unrealistic: they will have to find a small band or tribe that will accept them, where no one is a stranger, and where kings, presidents and bureaucrats are unnecessary" (p. 26).

2. That there is a human nature and that genetically we are still almost entirely hunter-gatherers. For Diamond, "in certain aspects, modern beings are maladjusted; our body and our practices currently face conditions different from those with which they evolved and to which they adapted" (p. 24). For example, discussing the development of non-communicable diseases (hypertension, diabetes, etc.), he writes: "our civilizational non-communicable diseases arise from an imbalance between the genetic make-up of our body - which continues to be in largely adapted to our Paleolithic diet and lifestyle—and our current diet and lifestyle" (p. 479).

Bearing both issues in mind, two important questions arise for me: is it possible that a society can consciously and voluntarily adopt aspects of other societies regardless of the material conditions in which it develops? and, on the other hand, bearing in mind the evolutionary history of the human species, which has been living as a hunter-gatherer for at least 60,000 years before adopting agriculture, can we only learn from hunter-gatherer societies the conclusions that Diamond draws?

To answer the first question I will use some of Diamond's examples. According to him, we should adopt a healthier diet: "fresh fruit and vegetables, low-fat meat, fish, nuts and cereals" (p. 539). Now, is it possible to produce and distribute these

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

products to feed 7,000 million people? The answer, as Diamond probably knows, is no. The population of the techno-industrial society is so exaggeratedly high that it is not possible to produce such an amount of quality food, to which is added that the need to distribute such food over thousands of kilometers does not exactly facilitate its freshness. Elsewhere in the book, Diamond addresses the question of education (pp. 239-243), comparing the "formal education of modern state societies" with timetables, subjects, and instructors, with education based on play and naturally arising from the social life of the TS, where children "learn by accompanying their parents and other adults and listening to stories told by the elders and other children around the bonfire". A child can learn to cook, hunt, cultivate or make tools by playing and seeing how adults do it, but the complexity of today's society requires that people have knowledge that is not precisely acquired around a bonfire, let's think, for example, in all the knowledge necessary to design, produce, maintain and operate a thermal energy production plant. So that a society can consciously and voluntarily adopt certain aspects of another society (this is the case, for example, of the generalization in the STI of tattoos as body adornment or the consumption of quinoa) but in those aspects determined by material factors and essential for the physical maintenance and development of a society, the range of variation is probably much smaller than Diamond posits.

As for the second question, I think that Diamond does not dare to draw other deeper conclusions because they would clash squarely with his values and those of his social environment. According to him "we can be grateful that we have discarded many traditional practices, for example, infanticide, abandoning or killing the elderly, facing a periodic risk of famine, being more exposed to environmental hazards and infectious diseases that often caused the death of children, and live in constant fear of being attacked" (pp. 24-25). Now, at what price? Perhaps Diamond's conclusions would have been very different if he had chosen other topics to deal with in his book, such as personal autonomy, mental illness or the impact on the environment. It is logical that if what is positively valued are "modern conveniences such as material goods that make life easier and more comfortable; formal education and job opportunities; good health, effective medicines, doctors and hospitals; personal security, less violence and less danger from other people and the environment; food safety; a much longer life; and a much lower frequency of experiencing the death of your own children" (p. 531) tend to extract from the TS only issues such as the amount of salt in their diets or their conflict resolution mechanisms (as long as they are not violent, that is, when they include dialogue and negotiations, but not wars and revenge), however, if what is valued is wild nature and freedom, then the nomadic hunter-gatherer TS will be shown as the form of society least harmful to wild Nature and that best suits our physical and psychological needs.

Grades

1. Original title: *The World Until Yesterday*. In Spanish it has been published by Random House Mondadori in 2013.

2. See the review of the same by GS on this same web page (Indómita Nature: [<http://www.naturalezaindomita.com/resenas/armas-grmenes-y-acero>][<http://www.naturalezaindomita.com/reviews/weapons-germs-and-steel>]).

3. Within “traditional societies” Diamond encompasses enormously economically and politically diverse human cultures: nomadic hunter-gatherers (!Kung, Inuit, Ache, Agta...), complex and sedentary hunter-gatherers (Ainu, Calusa... .), horticulturists (Dani, Machiguenga, Yanomami...), shepherds (Kyrgyz, Nuer...). Diamond himself acknowledges that it is a generalization but he probably should have been finer and not refer equally to dozens of societies to which, sometimes, the only thing that unites them is the absence of a State.

4. Diamond does not use the term “techno-industrial society” but refers to modern societies such as WEIRD. A word that in English means “rare” and that is the acronym for western (Western), educated (Educated), industrialized (Industrialized), rich (Rich) and democratic (Democratic).

5. This is the case of the chapter dedicated to religions and their social functions, where he addresses the limits of rational analysis and scientific explanation, the search for meaning or the cohesion and commitment of people in a community.

6. For example, regarding the life expectancy and longevity of the TS or the reasons that lead the TS or some of their members to adopt the modern way of life.

Review of the book *The world without us*, by Alan Weisman.¹

The journalist Alan Weisman makes, in this book (Debate, 2007), an extensive tour of different places on the planet. With this trip, he tries to answer the question: what would happen on earth if all human beings disappeared from one day to the next? This question, which can be very shocking and striking, actually leads to this other: what have human societies done and what are they doing to prevent wild nature from developing according to its own tendencies?

The answers, which Weisman provides over nineteen chapters with the help of a wide variety of experts, pay attention to the typical themes of the degradation of nature, but his way of approaching them is very interesting. By not having to explain these issues in terms of the harm or benefits they have for human beings, but rather in terms of the planet itself, it does not fall into an anthropocentric and biased view of ecological problems. Weisman, in proposing this exercise in speculative fiction, highlights the ecological damage *present* and *past* from the perspective of the Earth itself: the extinction of species due to the activities human, pollution in the atmosphere, oceans and soils, the transformation of ecosystems, etc. This is one of the strong points of the book. Today, unfortunately for us, the vast majority of books dealing with ecological degradation use the same yardstick: how does it affect human beings? As if that was the only important thing. This navel-gazing of measuring everything in this way is known as anthropocentrism.

Maybe Weisman also has an anthropocentric thought, I don't know; but, wondering what would happen to nature if we stopped degrading or destroying it, he gives his book a very different position. This provides valuable information on the ways that current human societies prevent the autonomy of the wild.

Another point in favor of this book is that it clearly reflects, with concrete and current examples, the strength of the wild and the great daily efforts that techno-industrial society has to make to stop or control it. This society is the worst enemy of the untamed, of the undomesticated and, fundamentally, therefore, it is a rejectable society.

But not everything in this book is interesting. If we were to try to solve ecological problems, this book would be perfectly useless. It does not propose solutions, neither reformist nor revolutionary. Perhaps it is only limited to saying that humans, after all,

¹ Review from *Renunciation* n°2.

are not so important and that the world would go on without them; life would recover and adapt with all its strength to that hypothetical world.

Perhaps it is a poor consolation in the disastrous ecological panorama that exists today. But it is a consolation that is useless if we want to help the wild come back to its own. If there is a feasible solution for human beings, something uncertain today, there is good reason to think that it will not be the search for the extinction of the species itself. (The views of some supporters of “voluntary human extinction” are briefly mentioned in the book. It is highly unlikely that such an initiative would succeed as it would go against our very nature—to reproduce is characteristic of our biology, to become extinct voluntarily is not. It is true that, in certain circumstances, there have been individuals who chose to commit suicide, but these circumstances are hardly — and would be— generalizable to the rest of the species). However, any feasible solution would imply taking equally drastic measures, such as those that would be necessary (and desirable) for the elimination of the techno-industrial system.

This book cannot contribute anything to this hypothetical solution, but it can contribute a lot to the analysis of the situation and from what perspective to understand it. A clue is given to us by ecologists, which Weisman cites, dedicated to the study of the wild fauna that lives in the Chernobyl nuclear disaster zone:

Typical human activity is more devastating to biodiversity and the abundance of local flora and fauna than the worst nuclear power plant disaster.

Presentation of “Is ‘The New Nature’ necessary?”

To the writer of this presentation, few books I have read have seemed more blatantly biased and lax than Fred Pearce’s *The New Wild*. This author, who amazingly enjoys a high reputation as a scientific journalist, commits innumerable outrages against science and reason in said book, with the blatant purpose of joining the bandwagon of so-called “neoconservationism”, a current that in recent years has been promoting the complete domestication of Nature on Earth, with the excuse that we are in the “Anthropocene” and that, therefore, the natural and the artificial are supposedly already the same thing (or rather that there is no more Nature to conserve). To do this, the followers of this current typically use without hesitation a series of fallacious arguments that range from creating straw men (affirming that conservation is based on identifying “wild” with “virgin” or defending a state of static equilibrium in ecosystems) to drawing unwarranted general conclusions from point data. The worst thing is that it has had quite an echo in those less ecologically informed sectors (from journalists to the general public).

The following review by Liam Heneghan rightly points out the main theoretical flaws in Pearce’s book. It is only regrettable that Heneghan, like many other individuals interested in conservation, has innocently swallowed the poisoned bait that the notion of the balance of Nature (or climax) is somewhat obsolete. To begin with, the false idea of the balance of Nature understood purely as “stasis”, that is, as the total absence of change in ecosystems, has never been defended by anyone who knows Nature at all (even less by biologists or conservationists). To continue, one thing is that Nature is in constant flux or movement and another that these changes never follow any order or adjust to certain limits and rules in any case. Dynamic equilibria often exist in ecosystems (eg climaxes); there is usually some constancy even within the change or disturbance itself (for example, successions). And even in those cases in which disturbances and changes seem to be irregular and unpredictable, there are certain limits, not everything goes, nor everything is possible. In science chaos is not absolute disorder, even in it there is a certain order. And finally, even if the exaggeration that everything in Nature is a disturbance were true, it cannot be drawn as a logical conclusion from this that artificial disturbances are the same as natural ones and should

not only be excused, but even promoted. This is to make a clumsy and dishonest ideological use of certain “scientific facts”.¹

Is “The New Nature” needed?: The new ecological controversies²

By[<https://lareviewofbooks.org/contributor/liam-heneghan>][Liam Heneghan]

I am writing this in a coffee shop. There appears to be only one species in this crowded room: a medium-sized primate with a penchant for disturbance. However, knowing a thing or two about the diversity of species - I am a zoologist by training - I realize that there are more species in this space than can be seen with the naked eye. For now, think of each human being as a type of ecosystem, made up of their native cells, tissues, and organs, and think of nonhuman organisms as invasive non-native species.

Put aside in your mind the images of those pesky bugs and microbes that inhabit the pantries of every coffee shop on Earth. Also ignore thoughts about the family of mice fighting over the crumbs that fall under the bar. After all, the staggering diversity of organisms that invade the primate body is disturbing enough, so let's focus on these "invasives." Amoebas slither over sore gums, armies of microinvertebrates raid the hairiest, moistest recesses of the body, and the skin itself is as covered in bacteria as a gas station toilet. Within the body the number of species is impressively high. More than 1,000 species of bacteria inhabit the intestine. Many are not casual stowaways but microorganisms essential to health that metabolize nutrients and synthesize vitamins. There are sure to be a few bad apples among the invading hordes. The plague³, for example, is horrible. And smallpox⁴ is best avoided. However, most cause nothing more than a runny nose, a mild rash, or a headache. Nothing to be alarmed about - and, after all, you deserve that day off from work.

Despite the clear usefulness of some of the members of our bodily menagerie, and the fact that many of the others opportunely increase diversity, we have declared all-out war on microbes. All for a few bad apples! Instead of vilifying these foreigners as outsiders, I argue that it is time to accept them as the key to our salvation.

¹ About the ideological use of the so-called ecology of chaos to justify attacks against Nature, see, for example, in Untamed Nature: Review of *Discordant Harmonies*

² Translation by Último Reducto of the review “Is there need for “The New Wild”?: The New Ecological Quarrels”, review of the book by Fred Pearce, *The New Wild: Why invasive species will be nature's salvation* (Icon Books, 2015). The review appeared in *Los Angeles Review of Books*, October 15, 2015:[<https://lareviewofbooks.org/article/is-there-need-for-the-new-wild-the-new-ecological-quarrels>][<https://lareviewofbooks.org/article/is-there-need-for-the-new-wild-the-new-ecological->]

³ *Yersinia pestis*. N. from t.

⁴ *Variola virus*. N. from t.

I call this emerging revolution in medical science the "New Health." It is a point of view that is, of course, opposed to the old orthodoxy.

If the preceding paragraphs constituted a book proposal, they would attract no publisher. In fact, they shouldn't. After all, we are usually reasonably sophisticated in our understanding of bodily harm and are usually able to distinguish between beneficial and harmful organisms. Yet despite encouraging indications from a more nuanced understanding of how exotic species in the body help maintain human health, apprehension about dirt and germs persists. Consequently, many doctors worry about the damage caused by an overzealous eradication of them. Among other obvious damage, a panoply of autoimmune syndromes. So while proponents of the "New Health" encourage us to favor exotic beneficial microorganisms—for example, by receiving a fecal transplant that introduces that healing goodness right out there—they are at the same time firmly resolved to eradicate harmful invasive organisms. After all, you can't defend against the plague.

I call the New Health advocacy that promotes a healthy body community but contemptuously downplays the negative impacts of pathogenic organisms New Health 1. I think we'll all agree that such a show would be a threat to the public. I call the defense that maintains a sensible distinction between neutral or beneficial bodily organisms and those that should be eradicated "New Health 2." I would certainly pay attention to New Health 2!

Now, if in the previous sentences we write "invasive species in the environment" instead of the various ways we have referred to organisms in and on the body, and "ecological health" instead of the expressions referring to well-being Personally, could we not have a solid model to think about the new debates that are emerging around the conservation of biodiversity? Invasive species are, generally speaking, those species that humans transport to a new region, where they reproduce, spread and cause ecological damage. That many species have become globetrotters is undeniable. The issue is this: Could it be that, despite prevailing assumptions, invasive species are helping nature rather than harming it? Could it be that "invasive species are nature's salvation", as Fred Pearce opines in *The New Wild* (2015)?

Eradication of invasives is often a preparatory activity for restoring "health" to ecological systems, however health is defined. Ecological restoration typically involves the reintroduction of native species - you can't have a tall grass prairie⁵, a geographically restricted habitat, without prairie plants. However, if, as Pearce asserts, the notion of restoration is based on an outdated model of how an ecosystem works, is restoration doomed? Could it be that the act of returning an ecological system to some previous state is more of an assault than a blessing?

Pearce poses these difficult and timely questions. Invasion ecology is, relatively speaking, in its infancy as a discipline, although it has already provided a scaffold-

⁵ "Tallgrass prairie" in original. It refers to a type of ecosystem native to the great North American prairies. *N. from t.*

ing for conservation-oriented land management strategies. At this very moment some ecological restorer is cutting down an invasive bush, poisoning an invasive weed, or perhaps setting a trap for a non-native mammal. And by cutting, poisoning, and trapping, I mean kill; This mission is not for the faint-hearted. Also, it is an expensive business. The consequent restoration of the ecological community is costly and fraught with practical difficulties. Half the time, problematic invasives regenerate or return to a system from which they have already been eliminated, especially those with underlying problems that are the result of historical mismanagement by humans.

These challenges could encourage scientists to be cautious about providing advice and encourage practitioners to wait for more information. However, the Holocene extinction, or Sixth Mass Extinction as some call it, brings a sense of urgency. Supposedly, the rate of species loss due to the influence of human-caused disturbances rivals cataclysmic extinction events in the past, such as the one that wiped out the dinosaurs at the end of the Cretaceous. This time, we humans are the comet, we are the sea that floods everything. Many ecologists say that losses due to ecological damage caused by invasive species are among the top five drivers of contemporary extinctions. In short: the nascent science of invasion ecology is joining the imperfect practice of ecological restoration under the blood-red sky of global catastrophe.

Pearce sets his sights on the edifice that has been built on the basis of anti-invasion efforts. It does not just remove the defective bricks, nor does it merely replace the building with another new building. Rather, it flips the building upside down, turning the whole damn construction upside down. Willing to turn the worldview of conservation upside down, he writes that “when invaded by alien species, ecosystems do not collapse. They often thrive better than before. The success of exotics becomes a sign of the dynamism of nature, not its weakening”. Elsewhere, using a medical metaphor of his own, he writes: “alien species . . . are often exactly the injection in the arm that real nature needs.” Thus, the beefy ecosystems of the New Nature⁶—the theory that applauds invasive species as our new saviors—are “normally richer than they were before.” This is bold and inspiring. But is it correct? For the most part, I think not.

Pearce’s New Nature fails in the same way that the fictional “New Health 1” paradigm, described above, fails. The book takes a few fairly convincing arguments - I’ll say more about these shortly - and extrapolates them beyond reasonable bounds. He backs up these rickety arguments with high-sounding generalizations, some of them so sweeping they make you gasp. For example, Pearce states, “When ecosystems change dramatically or simply can no longer meet our needs, we look for scapegoats and often blame our fellow aliens.” The statement is exaggeratedly categorical if one considers that the environmental sciences point to many other anthropic pressures to suspect: climate change, contaminated soil and water, etc. In *The New Wild*,

⁶ “The burly nature of the New Wild” in the original. In English there are more terms than in Spanish to denominate Nature (wild). Thus, in this case, both “nature” and “wild” mean “nature” in English. Therefore, this phrase has been translated non-literally to avoid redundancy. *N. from t.*

Pearce is actually so concerned about not throwing out the “baby” (the notion of the harmlessness or usefulness of native species) with the bathwater that he decides to conserve the bathwater, despite being dirty and even toxic.

In favor of the New Nature, Pearce makes the following claims. One, invasives add to diversity rather than suppress it, and therefore the biology of the invasion misrepresents the dangers; two, the demonization of exotic species says more about those who condemn invasives (they are xenophobic racists) than about the species themselves; three, denouncing what he calls a “dangerous mythology” concerning ecology, illustrates how nature works differently than we imagine; and four, outlines how conservation practice is built on a fallacious understanding of how nature works. So, he offers to restart the practice of conservation with his notion of “the New Nature”. In fact, his vision of a world “made up of new mixes of native and exotic species, living happily together, enriching our lives, maintaining ecosystems, and recharging nature’s batteries,” would be downright adorable. If it wasn’t because it’s not correct.

Pearce is clearly right in arguing that many non-native species are harmless or perform some service for us or other components of nature. With dandelions⁷, for example, you can make a delicious salad. In some cases invasive species have been incorporated into traditional medicine. In fact, this is a fundamental axiom of invasion biology: not all alien species persist in the environment, and of those that do, not all become problematic invaders. For the most part, invasive species biologists are actually indifferent to most non-native species.

It is also true that in some circumstances invasive species can be more conspicuous than harmful; we do not always have evidence of damage. Invasive species are legion, researchers are few, and time is finite. However, sometimes there is ample evidence that the impact is immense. Pearce reluctantly acknowledges this, wisely conceding that “sometimes we need to defend ourselves against pests and diseases, the inconvenient invaders of our spaces.” I dare you, though, to try to find an example of an invasive that Pearce can’t invest some charm in one way or another. Kudzu⁸, for example, is widely considered one of the most troublesome invasive species in the southeastern United States. It is a nitrogen-fixing vine that can cover bushes, trees, and human structures, and is widely known to block light from reaching other vegetation, killing it. Pearce acknowledges that the kudzu “extends its range by about 120,000 miles⁹ a year.” Its growth, he marvels, “seems to fit the image of America’s Deep South as somewhat depraved and rebellious.” Perhaps, he suggests, the kudzu could be used to make jam - it would certainly be delicious, depraved and rebellious jam. Meanwhile, kudzu offers metaphors for American-style growth. And he ends his account of kudzu on this hopeful note: “If I can unravel them [the metaphors] I may get to the heart of the American psyche.”

⁷ Composite plants of the genera *Taraxacum* and *Leontodon*. They are indigenous to Eurasia, but are invasive in the Americas. *N. from t.*

⁸ *Pueraria montana*. Legume native to Asia. *N. from t.*

⁹ Refers to square miles. 1 square mile is roughly equal to 2.6 square kilometers. *N. from t.*

One of the book's strategies—certainly a reasonable strategy given that the book's author is trying to challenge orthodoxy—is to quote liberally from maverick scholars. For example, quoting Jim Dixon, a botanist at the University of Glasgow, Pearce writes: "No plant endemic [to England] is even remotely threatened by any exotic plant." This is a reckless and provocatively false statement, given that there are more than 300 British plant species on Britain's 'Red List', a compendium of that region's endangered plants.

However, most of the dissenters whose arguments Pearce uses to undermine prevailing views about invasive species are themselves ecologists - indeed many would consider themselves invasion ecologists. This is not uncommon, of course, since controversy, supported by new data, may be the essence of paradigm shifts in science. Such skirmishes advance a discipline. To take just one important example, Dov Sax of Brown University, whose important work with Steve Gaines of the University of California, Santa Barbara, on island invasion and extinction, is summarized approvingly by Pearce. Sax and Gaines found that the number of bird species could remain constant or decline after the establishment of self-sustaining populations of non-native species on islands. Plant diversity, however, tended to increase more often than not to decrease. Pearce considers this a victory for his thesis. According to him, the study placed Sax at the forefront of "a new generation of researchers questioning the demonization of aliens."

It is indisputable that these discoveries provoked a vigorous debate among invasion biologists. One of the crucial points that deserves to be highlighted here (although Pearce does not mention it) is that Sax and Gaines themselves expressed concern about the meaning of the island invasion data. Of the bird data, they wrote that it means "that many unique endemic species have been lost and replaced by more cosmopolitan species from the landmasses." In addition, it must be said in their favor that they have a nuanced idea of the importance of the growth of the number of plants on the invaded islands. They speculated that the species count might actually continue to grow as more alien plants colonize the islands, and that this increase might not have consequences for other species. However, according to them, it is equally likely that new introduced exotic plants will continue to colonize islands, which could put "many native species in danger of extinction". In short, Sax and Gaines are carefully evasive. Weighing the alternatives, they frankly admit that they don't know which of the two is more likely.

Pearce's strategy of crudely summarizing an argument, or using idiosyncratic quotes without qualification or out of their original context, can be very productive in attracting supporters to his cause. However, for those who care about nuance and therefore a more accurate description of the state of affairs in reality, the strategy is worrisome.

Of course, in the index of *The New Wild* there are no entries for the terms "xenophobic",¹⁰ "Nazi", or "eugenics".¹¹ The disturbing implication suggested throughout the

¹⁰ "Xenophobe" in the original. *N. from t.*

¹¹ "Eugenics" in original. *N. from t.*

book, however, is that concern about non-native invaders is rooted in our innate xenophobic instincts. Pearce begins innocently enough: "Let's be clear, I'm not accusing environmentalists of being hidden xenophobes or misanthropists, much less racists." Somewhere else writes: "While no one would accuse today's environmentalists of being secret fascists, this political legacy . . . is troubling." Rarely, however, does Pearce miss a single opportunity to imply exactly that motivation. For example, he writes this about the work of invasion biologists: "zealous language, replete with military and xenophobic metaphors, has continued to be part of the everyday discourse of scientists investigating alien species, even appearing in their journal articles." research". When he does not accuse the main researchers of that discipline of flirting with eugenics, he applies the sanbenito of "gurus" to them. Daniel Simberloff, one of today's most renowned ecologists and editor of the scientific journal *Biological Invasions*, is a "guru"; Stewart Brand, the editor of the *Whole Earth Catalog*, is a "guru"; and even Charles Elton, the English zoologist who laid the foundations for 20th-century ecology and wrote the first book on biological invasions in 1958, is a "guru." In short, if we listen to Pearce, the science of invasion biology is ideologically suspect, its leading exponents are quasi-religious fanatics, conservation practitioners are hysterical, and the public is being brainwashed.

On a more lighthearted note, Pearce does a useful job of reporting how ecologists' understanding of the dynamics of nature has evolved. The notion of the "balance of nature" is no longer part of the discipline. Neither does the idea that, in the absence of human disturbance, ecological communities remain static. The disturbance in the "new ecology" is not external to an ecological system but is part of its essence. All of this seems reasonable enough. If all of nature is in flux, and if systems come together, fall apart, and take new forms, then surely the distinction between a human and a natural disturbance is a moot one. The transport of species around the globe is reasonably an extension of the natural wandering of organisms on the planet. This dynamic notion of nature plays a key role in Pearce's argument. And this perspective actually fosters a new idea of invasive species. He writes: "if ecosystems are open and dynamic, then alien species have as much right to become part of them as native ones – and can be just as useful".

However, none of this is completely new. After all, notions about the balance of nature have been "attacked by dissident scientists, who saw them as romantic or religious nonsense with no scientific basis." In fact, one of the first maverick ecologists to express doubts about a balance in nature was Charles Elton. Remember that Elton founded the discipline of invasion biology and was one of the "gurus" criticized by Pearce mentioned above. Elton was saying this as early as 1930: "'The balance of nature' does not exist, and perhaps never has existed. The populations of wild animals are constantly varying to a greater or less extent, and the variations are usually irregular in their periods and are always irregular in their amplitude. More recently Daniel Simberloff (also referred to as a "guru" in the book) was also writing on this topic and concluded that, for academic ecologists, "the notion of a balance of nature is a thing

of the past.” The concept, says Simberloff, ”is useless as a theoretical framework or as an explanatory tool.”

I quote Elton and Simberloff because I would like to make it clear that, unlike Pearce, one can both take a contemporary perspective on the flows of nature and yet hold the view that many invasive species are problematic and that their removal is a prerequisite for conservation attempts. Therefore, restoration attempts, the form of conservation that often advocates the removal of invasives as a first step in repairing damaged ecosystems, are not actually trying to return nature to a previous balance. Rather, it attempts to restore the historical trajectory of ecological systems. Think of it this way: Restoring degraded ecosystems is like restoring personal health. In restoring the health of a loved one, no one expects, I think, that the sick person will permanently return to their youth. Rather, at best, it takes that person back to the path they were on before they got sick.

We are surely going to have a New Nature whether we like it or not. In some cases, the New Nature will contain new ecosystems with no historical analogues. This will certainly be the case in urban settings, where conservation is not always feasible or desirable. The problem is that we could also end up accepting New Nature in places where conservation is considered a priority and where we want, for some combination of scientific and ethical reasons, to protect rare creatures. I fear that we may end up accepting the New Nature based on flimsy but seductive arguments.

Pearce offers us the New Nature 1, when what we need is the New Nature 2. The book uses, I would say even unwisely, poorly researched and biased data. Part of its danger lies in the fact that it offers a false sense of comfort and can therefore encourage complacency. It is a lull that lulls us to sleep, when what we need is a guide to safer conservation action. If, as the book suggests, we don't have to worry about invasive species, and if our ambitious plans - to protect small areas of high conservation importance from invasion - are all wrong, what kind of action proposes the New Nature of Fred Pearce? None at all. We do not need to abandon the soft comfort of our armchairs.

Earth's Revenge and *Earth Runs Out* LOVELOCK: A NEW NOTICE TO SAVE CIVILIZATION

(Review of the latest books by James Lovelock, by AQ)

1. Introduction.

Lately, voices abound warning about the dangers that industrial civilization may face in the near future. For example, books such as *Collapse* by Jared Diamond or *Our Final Hour* by Martin Rees were, respectively, an analysis of the possible causes of the collapse of a complex society and a warning about the dangers that technological development may bring in the coming decades. A leftist school of thought based on planned economic decline (known colloquially as "decreationism") has even reached a certain height in various sectors of techno-industrial society, which has a similar effect to any other leftist school in today's society: to serve as alert mechanism indicating possible failures or dangers for the proper functioning of the techno-industrial society and proposing solutions to them. Along these lines are the last two books published in Spanish by James Lovelock (Great Britain, 1919-), *The Earth's Revenge*¹ (Editorial Planeta, 2008) and *La Tierra runs out*² (Editorial Planeta, 2011). Specifically, Lovelock's writings deal with one of those possible dangers for industrial civilization: the hackneyed "climate change" or "global warming", which I will talk about in the next point. These are two books with a very similar approach and content, as well as being written very close in time, so the following review will be based on both texts.

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

2. Gaia theory and climate change.

James Lovelock (inventor, physician and geophysicologist[831]) was, together with the biologist Lynn Margulis, who formulated, during the 1960s, the theory known as the "Gaia hypothesis", according to which the planet Earth behaves in a similar way to a living organism, regulating the climate and chemistry in such a way that it tends to remain optimal for the development of the different forms of life that inhabit the planet.

His theory did not initially have a good reception within the scientific world, mainly for two reasons:

The first is that Lovelock's way of expressing himself, with abundant metaphors about the Earth as if it were really a living (and even conscious and intentional) organism, attracted some philosophical currents whose heyday coincided in time with the public formulation of the theory. of Gaia: the "New Age" (New Era) and the "hippie" movement. In fact, there is even a religion called "Gaia", which personifies the planet Earth in the form of a goddess. As Lovelock himself explains, due to the pseudoscientific nature (when not directly irrational and crazy) of these currents, the Gaia theory was directly rejected by many scientists without even discussing it.

In Lovelock's last books, the author repeats several times that it is only about metaphors (that he does not see the planet Earth as a being with consciousness and will). Sometimes in a contradictory way³. But this, in the event that it was also said in its day, was not enough not to be taken as a reference by hippies and crackpots.

The second reason why it seems that this theory provoked notable controversy within the scientific world was the fact of relating various branches of Science that, until then and to a certain degree now, have remained separate. In particular, Lovelock's assumption that physics, chemistry, or climate is affected by the evolution of life forms, and not just the other way around, falls outside the framework on which evolutionary (Darwinian) biology was based. the epoch (in which species evolve by natural selection with a background environment over which life forms have no influence) and also included extraneous factors in the Earth sciences⁴, which have been studied independently to planetary life forms. Part of the blame for this controversy has been Lovelock himself, as he formulated the theory simplistically and went too far, claiming, for example, that it is life forms that regulate the Earth's climate and chemistry, and even that this is the objective of life forms (today the author himself admits that the "Gaia hypothesis", as formulated in the 1960s, was wrong, but continues to defend

³ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

⁴ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

some of its most controversial aspects). All of this led to a barrage of criticism from evolutionary biology and the Earth sciences.

The conclusion that forms of life and the planet affect each other has recently obtained remarkable evidence in its favor due, among other things, to a fortuitous event: "global warming" or "climate change". It seems increasingly clear that humans, through the techno-industrial society, are altering the planetary climate (beyond natural climate fluctuations) due to changes in terrestrial and marine ecosystems and in the chemical composition of the air. This is the main theme of Lovelock's last two books. And he sums it up like this:

"The Earth, not for our benefit but for theirs, could be forced to evolve into a warming age, in which it can survive, albeit in a depleted and less habitable state. If, as it seems, that happens, we will have been the cause" (*The Earth is depleting*, page 15).

Where Lovelock says: "The Earth", it could be said, in a broader sense: "Wild Nature". Although, as we will see later in greater detail, the author's concerns, despite appearances, are ultimately not directed at the damage that global warming can cause to Wild Nature, but to modern industrial civilization.⁵

There are some successes in James Lovelock's books that are worth mentioning because they are aspects that few people seem to pay attention to, or uncomfortable truths that very few are willing to accept. And I am not referring only to the population in general, but to the environmental movement in particular.

Overpopulation: One of those successes is that the author openly acknowledges that the planet is currently overpopulated with humans, and that the human population that exists right now is not compatible with biodiversity or with a self-regulating planetary climate⁶. And it even recognizes that the uncontrolled increase in the human population on the planet, and with it most of the current important problems, are long-standing issues, related to the development of agricultural and livestock societies and even to the use of fire and technology. (later I will say something about the latter).⁷ It is therefore a much deeper analysis than is usual (presenting current problems as the result of premeditated decisions or the conflict in recent centuries between different humanist currents).

We are not alone and we are not in charge: Another success is that he mentions (although a careful reading of his books shows that he does not really accept it) that the human species is just one of all those that inhabit this planet, and that it is necessary for humans to leave space where Nature can continue to regulate itself (wild

⁵ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁶ A couple of examples:

⁷ For example: *"We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible."* (*The Earth runs out*, pages 246-247).

territories).⁸ It is not a clearly ecocentric notion (it continues to grant a preponderant role to humans in ecosystems), but neither is it totally anthropocentric (it takes into account other forms of life or mainly wild environments). I would say that, for a European environmentalist, Lovelock in this and other respects goes a little further than most, even if he does not go as far as would be desirable.

How environmentalism developed: A third important point I see in Lovelock is his analysis of the development of environmentalism throughout the 20th century. He mentions the American wilderness movement as the beginning of modern environmentalism and not Rachel Carson's well-known book "Silent Spring" (which is often referred to as the beginning of environmentalism). In addition, it explains how the political left has been mixing with the environmental movement until disfiguring its agenda, including issues that have little or nothing to do with the conservation of Nature.⁹ Although it is not at all clear that he is totally against this mixture. It also shows the leftist character that the anti-nuclear movement had from its beginnings, from which most of today's social environmentalism arose.

Sustainable development and renewable energies: Another noteworthy success: Lovelock's criticism of sustainable development and so-called "renewable energies" should be highlighted. The latter are described by the author as little more than an economically profitable business for companies in the sector and certain countries, as well as a hoax for the population (promoted by many environmental groups).¹⁰ Love-

⁸ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁹ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out*, page 237).

¹⁰ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

lock's position regarding sustainable development is, in the abstract, against it (for example, see note 6), although he is in favor of technological development. What he proposes is a process of degrowth of industrial civilization which he calls "sustainable retreat."

This is another point that makes this environmentalist somewhat different from the majority of European environmentalism, which is usually favorable to "renewable energy" and "sustainable development".

What motivates scientific work: Finally, Lovelock may also have a point when he says that scientists are uncomfortable with Gaia theory because it is a threat to their daily lives (*Earth runs out*, page 196). Or that the results reflected in their studies are influenced by the status or economic benefits they can obtain to continue their work.¹¹ In a way, it is emphasizing that there are other motivations in scientists beyond doing good to humanity or the planet, and that these can have a primary influence on the course of scientific work. All of this is somewhat reminiscent, apart from the differences, of what the Freedom Club said in *Industrial society and its future* about motivations in scientific work.¹²

3. Errors and contradictions.

The most important issue I want to highlight about these books is Lovelock's humanistic ethic. And I say that it is the most important thing because his way of understanding the world and the current situation emanates from it, as well as what he sees as problems and the practical approaches that he proposes to try to solve them or, at least, alleviate them. As I have tried to show in the previous point, Lovelock possesses to a certain extent some ecocentric values (certain respect and devotion for Wild Nature), but this tendency is hampered time and time again by humanist (anthropocentric) values that lead him to contradict himself. in his speech many times. Despite this, he does not seem to be aware of the lack of logic that characterizes his speech at times, as I will try to show at this point. In addition, Lovelock presents himself as an independent scientist who does not have to answer to any institution, and assures that this independence allows him to "*consider the health of the Earth without the limitation of having to put the well-being of humanity first. humanity*" (*The Earth is depleting*, page 47). But the truth is that sometimes the homage is unconscious: the examples that Lovelock's thought is constrained by his humanist values are many and very clear, and I will show a few below.

¹¹ For example: "*In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined.*" (*Earth's Revenge*, page 166).

¹² In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

The Earth is not the most important thing to Lovelock: As much as the author says, in the abstract, that the Earth is the most important thing to him, what really matters to him is saving industrial civilization.¹³ He does not seem to understand (or his humanistic values do not allow him to recognize) that civilized societies, due to their greater size and complexity, are precisely those that have caused the greatest damage throughout history to wild Nature. Or that, refining a little more, it is precisely the techno-industrial society (due to its larger size and the effects of modern technology -and regardless of the good or bad use that one wants to make of technology-) the one that has caused the greatest damage to Wild Nature (the one that has to extract the greatest amount of matter and energy from ecosystems for its functioning, among other things). In other words: industrial civilization has been, is and will be the greatest threat to Wild Nature, the biosphere or, as Lovelock likes to call it: Gaia. And only ignorance or humanist and leftist prejudices can make someone deny this great truth. Furthermore, it sometimes seems as if, for Lovelock, the end of techno-industrial society and the extinction of the human species were the same thing, when it is evident that they are not¹⁴.

Human civilization does not have the value that Lovelock claims to give it: Lovelock repeatedly tries to convince the reader that civilized ways of life, and even the human species, have a value that they do not have: “*What has encouraged me most while writing this book has been the idea that human beings are of vital importance to Gaia, not through what we are now but through our potential as a species capable of being progenitors [sic] of a much better kind. Whether we like it or not, we are now their hearts and minds, but to better continue to play this role we have to ensure our survival as a civilized species and not return to being the conglomerate of warrior tribes that we were at some point in our evolutionary history.*” [...] As part of Gaia, our presence begins to make the planet sensitive. We should be proud to be part of this huge step, which may help Gaia survive as the sun continues its slow but relentless increase in heat production, making the solar system an increasingly hostile future environment. ” (The Earth runs out, page 44). *Although for this he has to contradict himself with his own words: “It is arrogance to think that we know how to save the Earth: our planet takes care of itself. The only thing we can do is try to save ourselves.” (The Earth is running out, page 25). Indeed, the world and life could go on without us, just as they did before our species arose, let alone simply evolve without civilized ways*

¹³ Examples:

¹⁴ Moreover, it could be argued, not without reason, that it is precisely the survival of the techno-industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

of life (more on that later). This is a clear example of how humanistic prejudices can distort the thinking of people who otherwise seem to have a devotion to wild Nature.

Rural environments are not the best for humans: He also tries to convince the reader by arguing that humans are better off living in rural areas than in the wild: *"Make no mistake, our instinctive fear of wilderness runs deep: utterly wild places are as hostile to naive city folk as the landscape of an alien planet [sic] infested with monsters. There are forms of life, from microorganisms to tigers, passing through nematodes, invertebrates, snakes and, of course, other human beings, that are potentially dangerous to us if we were to settle near them. It is not surprising that primitive man separated his fields from nature and gradually became a farmer, since he saw as pernicious all life that was far from his cattle, crops, employees and relatives. Then we build cities - fortresses - to separate ourselves from wild nature and dominate the countryside, so that it can provide us with food, fuel, minerals and building materials. There is nothing unnatural in this evolution. Termites and other social insects have done it in their own way too. Where we are different from all that came before us is that we have escaped the causes of premature death, predation, famine and disease, the things that once frightened us."* (*The Earth is depleting*, page 26). Lovelock flagrantly misrepresents reality here on several issues:

- There have been (and still are some) human cultures that have lived for tens of thousands of years in wild environments under uncivilized hunter-gatherer ways of life (indeed, they account for most of human evolutionary history). Many of these have not abandoned that way of life until they have had no choice but to do so (due to destruction, colonization, military defeat, confinement in reserves, decimated by diseases brought by civilization, etc.); and that sometimes they lived in the surroundings with agro-livestock societies and therefore they knew these other ways of life. So it is not at all true that humans feel an "instinctive" fear of wild Nature, even though humanists would like it to be so.

- We are genetically adapted through evolution by natural selection for life in the wild (as nomadic hunter-gatherers). And Lovelock himself acknowledges this on at least one occasion: *"We have perfectly evolved to live as hunter-gatherers. Evolution adapted the wings of our brains to survive in the world of a million years ago, but we are so ill-prepared to survive on 21st-century Earth that we have become like a hawk in a cave."* (*The Earth is exhausted*, page 92). Then it is not only that we do not have to go wrong in wild Nature, but only integrated in it can we develop and correctly satisfy all our capacities, tendencies and innate needs.

- The evolution of social insects, beyond superficial comparisons, does not have much to do with the development of certain human societies in recent millennia, no matter how much Lovelock wants to play down the development of complex societies by calling them "natural". The word "natural" is often used to designate that which has not been created by humans (the opposite of "natural", according to this conventional meaning, would be "artificial"). But there is another meaning according to which the "natural" is everything that is not "supernatural". Under the first meaning, everything that humans

create or modify would be artificial, under the second, natural. Lovelock confuses using one or another meaning depending on what he is interested in arguing, and thus it is very easy to pass off as true or defensible things that in reality are not: that if insect societies are acceptable for being "natural" ("not artificial"), the civilizations of human beings must also be acceptable because they are not "supernatural".

- On the other hand, the fallacious use of the behavior of other species to justify human behavior is very common, but not at all scientific. Lovelock is not so fond of humans solving their problems through war, destruction, and annihilation of other groups of our species (see note 13 and the first quote of the point "Human civilization is not of the value that Lovelock claims). grant him"), even though this is a behavior that many of us have seen perform between communities of ants or other social insects. In reality, social insects have evolved to develop the complex communities in which they live, whereas humans have not evolved living in complex societies until very recent times on an evolutionary scale (as Lovelock himself acknowledges elsewhere. See a couple of paragraphs back), but in small groups of nomadic hunter-gatherers, in fundamentally wild environments. We are not social insects, but mammals belonging to the group of primates.

- Ecosystems, without losing their wild character, can also provide "food, fuel, minerals and construction materials" to humans. Before farming and civilization, humans did not live on air, nor did they survive by chance. These types of arguments are usually put forward by people of a humanistic nature to denigrate everything that comes before civilized ways of life.

- Finally, I don't know if it is necessary to explain that today there are still many "causes of premature death, predation, hunger and disease" (some have even been created or favored by the techno-industrial society). As soon as you think, the reader will come up with many examples.

The goodness or badness of modern technology does not depend on how it is used: Apart from praising civilization, Lovelock also tries to justify technological development by dismissing all kinds of moral values towards technology. To do this, it tries to sneak in, again playing with the two different meanings of "natural", that modern technology, given that it ultimately comes from materials extracted from Nature, is as natural as anything created by Nature itself: "*But since we are neither gods nor goddesses, who can produce energy or matter from nothing, we have to obey the laws of the universe, and of course this implies that nothing we do is natural.*"¹⁵ *A four-wheel drive minivan with fuel in the tank is as natural as a termite nest. Without life on Earth, neither of them would exist, nor would the car be able to drive; we easily forget that fuel is useless without oxygen. Minivans and their fuel are not inherently good or bad, although what you do with them may be. So what's all the fuss about? Because*

¹⁵ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

there are so many of us that we burn fuel a hundred times faster than the Earth takes to renew it." (The Earth Runs Out, page 138).

At first glance it may seem that a technology can be good or bad depending on the use one wants to give it. But, at least in the case of modern and industrial technology, this is not the case. Technological development is often the cause of population growth in human societies. Specifically, the industrial revolution is the direct cause of the fact that the planet is currently overpopulated with humans (in the approximately 200 years between now and the start of the industrial revolution, the world human population has multiplied by seven) and, therefore, therefore, of all the problems arising from such overpopulation, as Lovelock acknowledges elsewhere (see note 7). It is not just that there are too many people burning fossil fuels, it is that, today, for it to be profitable in this society to obtain and use fossil fuels (and the devices that consume them, such as cars) there have to be many people.¹⁶ Technology and demographics are two factors that normally feed each other during the evolution of a society. For this reason alone (and there are more reasons) it cannot be said that modern technology is harmless in itself.¹⁷ Comparing a car to a nest of termites is another example of the confusion over the term "natural": cars are a human invention (something artificial), but since they are nothing "supernatural", for Lovelock they already seem to be the same as the works of Nature.¹⁸

The true human nature is not what humanism paints: Lovelock's understanding of human nature is permeated by some very common prejudices in the way people think. Humanism is a philosophy of civilized societies. It tries to justify the existence of this type of society by deforming the perception of human nature until it gives an image of it that is compatible with civilized ways of life. Lovelock does not escape this falsehood, and the fact that human biology is not his scientific specialty is not enough to explain some of his errors in this field. In principle, scientists should be people who are sufficiently informed and objective so as not to ignore scientifically recognized facts in their arguments. And surely scientists know these facts perfectly well. But the humanistic cultural baggage of most of them makes them "go through the lining" of scientific knowledge (for which they drool so much on other occasions) when-

¹⁶ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁷ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*"*, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (The Earth is Running Out, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁸ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

ever they consider it necessary (when not directly contradicting what they themselves express elsewhere or moment, as I have shown before). There are several examples of this in Lovelock:

- The clearest example is that he affirms that the human being is the only animal capable of thinking and communicating his thoughts. (*The Earth runs out*, page 40). Or that it is the first social and intelligent animal. (*The Earth runs out*, page 253, quoting EO Wilson). However, ethology (the science that studies animal behavior) offers examples of cognitive abilities that go beyond mere innate response, communication and social life in other animal species.¹⁹ These scientific discoveries highlight the continuity and similarity between humans and other species. In other words, we are just another animal species, with our similarities and differences with other species. The problem is that humanism insists on boasting of those cognitive capacities that humans have developed to a greater extent than other species, such as evolutionary adaptations to the problem of survival and reproduction, considering them superior to those in which the rest of the species stand out. species. As science provides evidence of "high" cognitive abilities in other species, humanism could redefine terms such as "intelligence", "thought" or "communication" so that they only include those for which there is no evidence of their existence. existence in other species, but this would only serve to confirm the current need for humans (within the techno-industrial society) to possess an ideology (such as humanism) that comforts them by showing them as something alien and superior to wild Nature, even if only in part. against all scientific evidence.

- It also states that humans have a "synchronization of the will" similar to that of social insects, termites and flocks of birds and fish. (*The Earth runs out*, page 254). Evolutionary biology affirms that the natural human sociability is selective and is framed within a small group of relatives. Very probably our evolutionary past has endowed us with the tendency to follow a leader or to identify with a small group (the social reference group). This falls within the possibilities of life as hunter-gatherers. And perhaps an incipient change caused by the abnormal conditions in which the techno-industrial society is forcing an increasing percentage of the human population to live, will cause that to change in the future. But the reality is that mass human societies are too recent a phenomenon to be adapted to them at an evolutionary level, which is what Lovelock means by "synchronization of the will."

- The third and last example is that Lovelock characterizes the human being as an unfinished product that must continue to evolve until it reaches perfection. That it is not yet truly social, truly intelligent, that it has not evolved enough to coexist on this

¹⁹ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

planet with the rest of the forms of wild life, etc. (*The Earth is depleting*, pages 21 and 259). Darwinism postulates that evolution by natural selection is an uninterrupted process that has no goal or end. And today's wild species are well adapted to the wild environments in which they have evolved. In the same way, the capacities of the human mind and body (including intelligence or sociability) are well adapted to the environment and type of life that humans have led for hundreds of thousands of years (small groups of hunter-gatherers nomads in wild territories.). This type of life led our species to spread over a large part of the planet and survive various climatic changes (changes between glacial and interglacial periods).

The problem comes when someone pretends that millions of Darwinian survival and reproduction "machines", like us humans, behave like brothers, cooperate and live in peace hand in hand. Life on the planet, regardless of whether or not it influences the chemical composition of the air or the climate, has evolved through the survival and reproduction of genes, and when things like coexistence, solidarity or tolerance occur in the behavior of any form of life is because the genes that favor such altruistic behaviors have obtained some kind of reproductive benefit from them throughout evolution, not because they are the best for all forms of life.

There are indications that some groups of primitive humans were related to various extinctions of flora and fauna.²⁰ But as much as Lovelock and others today justify modern technological development on the grounds that in the past humans also caused changes in the ecosystems they inhabited, the changes that techno-industrial society is currently bringing about across the planet are not. They are far from equal in any previous society (not even in the most advanced pre-industrial civilization). Now it is not simply about the reduction of biodiversity on a continent, but about the transformation of a large part of the terrestrial ecosystems, of the seas, changes in the chemical composition of the air and even in the climate, to give some examples of what which is already happening. And, to everything that is already happening, we should add the consequences for wild Nature of what may happen in the near future (what industrial civilization will take ahead in its eagerness to save itself). So it does not seem that the "path to perfection" that Lovelock proposes is going to make the techno-industrial society "learn" to coexist with the rest of the species. I say "techno-industrial society" and not "humans" because Lovelock and others' daydream about the perfection of the human being goes through the survival of said society. And this society is incompatible with wild Nature (destroying the wild is the essence of its operation).

The "ecotechnological" future that Lovelock proposes is demeaning for humans and enslaving for wild Nature in general: At one point in one of his books, under the heading "Utopian food and lifestyle" (*The Revenge of the Earth*, pages 193-195), Lovelock speculates about some of the characteristics that what he calls a

²⁰ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

“compact, high-tech, low-consumption civilization” should have if it is to survive climate change in grade. Which, in short, are:

- Synthetic food for eight billion humans. Natural (not synthetic) food will be a luxury for the upper classes.

- Division of the territory of each State into three equal parts: (1) urbanized areas and communication routes, (2) intensive cultivation and (3) territory where Wild Nature can self-regulate, without any type of interference or control by the humans (although at another point in the book he proposes that this would be a good place to leave nuclear waste).

- Crowd the population into compact cities to save energy.

- Replace air transport with high-tech sailboats.

- Promote the use of low-consumption technological devices for leisure (mobile phones, Internet, video games,...) so as to reduce private transfers by car and plane. He goes so far as to affirm that mobile phones are one of the most environmentally friendly inventions in history.

- Surveillance to restrict the consumption of luxuries that threaten “Gaia”.

Many things could be criticized about the feasibility or not of these proposals, but that is something that is not important. What is really important is: what kind of world would we have if these kinds of utopias came true? It is very worrying to see what kind of society and world some are fighting for under the banner of environmentalism and the defense of the Earth: under the appearance of defending a self-regulating biosphere hides a desire to save civilization at all costs. Even if it is at the cost of increasing and perpetuating the domination of wild Nature by techno-industrial society, further reducing individual freedom, or deceiving humans into conforming to living in “virtual realities” given the impossibility of developing their nature in a real world increasingly degraded and saturated by multitudes of humans and machines.

Not everything human is threatening to wild Nature: Humans also have a place within wild Nature. But a common way of justifying civilized ways of life is to argue that, wherever there are humans, there is no wild Nature and, therefore, it makes no sense to reject techno-industrial society or civilization under values of respect for wild Nature, since that would be to fall into misanthropy (wanting our species to disappear). Lovelock similarly asserts that humans have been linked to the destruction of the planet since we began to use fire and technology (see note 7).

As I have commented before, it seems that some primitive cultures were an important factor in changes in the flora and fauna of the places they inhabited. The clearest known example is perhaps that of the Australian aborigines, who degraded the original ecosystems of that continent through fire (see note 20), an example that Lovelock comments on in one of his books²¹. These are objectionable facts that there

²¹ “A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed

is no reason to hide. But the fact that certain primitive cultures misbehaved does not mean that the use of fire or technology is always contrary to the self-regulating processes of wild Nature. In fact, the use and manufacture of tools (technology) and the use of fire for cooking or heating are something that has accompanied our species since its inception and has generated various physical and psychological changes in our nature. While the agricultural and/or civilized ways of life are something recent on an evolutionary scale (for which we are not genetically adapted) and adopted independently (without pressure from any other society) only by part of the cultures human (as I explained before). With fire and primitive technologies we may be able to be inside wild nature, but with agriculture and civilization it is clearly not. [832][833][834][835][836][837][838][839][840][841][842]

and techno-industrial society, the wild always loses out. Lovelock's environmentalism, despite not being the most conventional in many aspects, proposes a future that shows no differences in terms of said rule.

I am convinced that the vast majority of environmentalism (at least as it is articulated here in Europe) is nothing more than an outpost of the values of techno-industrial society, just like leftism, of which it could be said to be a part. In this case, Lovelock warns, proposes, attracts people who may be sincerely concerned about what this society is doing to Wild Nature and, like it or not, traps them with humanist taboos and prejudices, enclosing them in a circle in the that, come what may, industrial civilization cannot be touched.

On the other hand, these books show (exaggeratedly or not) the ecological problems that the techno-industrial society is currently facing or will have to face in the near future. Keep in mind that these are just some of the problems that this society is going to face. Some problems arising from technological development cannot even be predicted. But among the predictable ones, to the problems of an ecological nature, we should especially add the problems related to the control of human behavior (related to the maladjustment of human nature to modern living conditions), which should become more acute as the techno-industrial society make humans live in environments increasingly different from those in which our species evolved.

There are many possibilities that a context is approaching in which the techno-industrial society loses strength going through notable problems (much more than the current economic recession) and under that conjuncture a movement that proposes to favor the collapse of the industrial technological system (or what it is the same, preventing industrial civilization from recovering) would have an unbeatable opportunity and, what is more serious, perhaps unrepeatable. For this to happen, the movement probably has to be formed and prepared in advance, and that is the biggest difficulty right now. Those who think that nothing needs to be done because the techno-industrial

the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

society will sooner or later collapse on its own, should think about what will be left of wild Nature on planet Earth before that happens (if it happens). James Lovelock may be exaggerating about the problems looming over techno-industrial society; but, be that as it may, his books show some examples of what this society will do with wild Nature if it is necessary for it to survive.

Grades:

- *“We must understand that the ‘silent spring’ did not come simply from pesticide poisoning; birds died because there was no longer room for them in our intensively farmed world. There are so many humans who want to live as we currently live in the first world, that we are kicking our partners, the other life forms, off the planet.” (The revenge of the Earth, page 163).*

- *“It all depends on the population [...] If there were only 100 million peisonas on Earth, we could do almost whatever we wanted without causing harm. With 7 billion I doubt that there is anything that can be sustainable or significantly reduce the burning of fossil fuels; By significantly I mean enough to stop global warming. Seven billion people living as we live, and as we aspire to live, are too many for a planet that tries to self-regulate its climate” (The Earth is running out, page 132).*

- *“Not only must we save ourselves, but we must also remain civilized and not degenerate into a law of the street where the leaders of the gangs impose themselves as warlords” (La Tierra se runs out, page 102).*

- *“Nuclear energy is simply the medicine that will provide us with a safe and constant source of electricity so that the lights of civilization will continue to burn until clean and eternal fusion energy - the energy powered by the sun -, and renewable energies are available. And resorting to nuclear energy is not the only thing we will have to do if we want to prevent a new Dark Age from occurring in this very century” (Earth’s Revenge, page 31) .*

- *“[...] I cannot remain impassive while civilization is drunk to death on fossil fuels.” (The Earth’s Revenge, page 207).*

And all this without forgetting that the extinction of the human species would not be anything catastrophic: without our species, life and Evolution could continue their course without any problem (as long as the way in which our disappearance took place did not entail in turn mass extinction of too many species). However, without the wild, the planet would be nothing more than a huge technological ball under artificial control, little more than a gigantic city; and our species, if it continued to exist and could continue to be called human, would no longer be a product of evolution or chance, but a manufactured product. What is scarier, a world without humans but wild or a world, with or without humans, where everything is designed and controlled by a technological system? The latter is a real threat to wild Nature (or to the planet Earth), the end of humans and their works, no.

For an explanation and examples of communication in non-human animals, see, in the same book, Chapter 10: Animal Communication and Human Language (pages 373-408).

Linkola and Kaczynski, a comparison

By The Bloody Sire

Many of the people who are drawn to the works of Ted Kaczynski also express admiration for the late Finnish ecologist Pentti Linkola. At first glance it is obvious why, both writers offer a sharp critique of modern technological civilization. However, there are crucial differences between the two, and it is important not to confuse one with the other. It could be said that the alternatives proposed by Kaczynski and Linkola are one "libertarian" and the other "authoritarian", respectively.

In this essay I am not going to argue morally against Linkola's authoritarianism, the reader may be outraged by some of Linkola's views, but I am going to assess him on his own terms: who, Linkola or Kaczynski, presents more likely to permanently destroy the techno-industrial system?

First of all, what was Pentti Linkola thinking? Linkola described himself as a "deep environmentalist",¹ a rather broad term but one that could be defined as "one who believes that wild nature is the highest good and that it has an inherent value independent of humanity" (I fully share this belief). Linkola's interpretation of deep ecology led him to the conclusion that human freedom inevitably leads to ecological degradation and that dictatorship is therefore preferable to democracy. He defended that the less freedom human beings had, the better it would be for the environment.² Linkola considered overpopulation the greatest threat to the planet and argued that a world government should impose strict limits on reproduction globally, as well as limit the amount of resources that people could consume.³ Regarding technology, he stated that "everything that has been developed in the last 100 years must be destroyed."⁴

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

² Original title: *The Vanishing face of Gaia.*

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

(Since he wrote during the turn of the millennium, this would mean a return to the technological levels of the late Victorian or Edwardian era.)

Let's examine these proposals in depth. Is it true that less democracy and fewer freedoms result in lower levels of ecological degradation? There are cases in which some dictatorships have managed to "go green", but in general these have been "soft" dictatorships, which preserved a certain facade of democratic action, instead of completely totalitarian states; so Linkola's claim that there is an inverse correlation between democracy and ecological preservation does not hold water. To mention a few examples: the Joaquín Balaguer regime in the Dominican Republic was truly authoritarian, elections were frequently rigged, and human rights abuses were commonplace.⁵ Balaguer, who also wanted to preserve the Dominican Republic's rainforests, placed the country's forests under army control and ordered illegal logging to be shot.⁶ Robert Mugabe applied the same to Translation by Último Reducto of "Linkola and Kaczynski, a comparison". The original article of which this is an adaptation was published on *Tedkaczynski.boards.net*, on November 8, 2020:[<https://tedkaczynski.boards.net/thread/28/essay-linkola-kaczynski-comparison>][<https://tedkaczynski.boards.net/thread/28/essay-linkola-kaczynski-comparison>]

[<https://tedkaczynski.boards.net/thread/28/essay-linkola-kaczynski-comparison>][comparison.]

© Copyright The Bloody Sire, 2020. N. treatment of Zimbabwean poachers.⁷ Similar policies can be seen in Alexander Lukashenko's notoriously oppressive Belarus⁷ - the government of this country is doing a much better job of preserving its share of the Bialowieza Forest than its more democratic neighbor, Poland.⁸ This "eco-tyranny", however, can also be contrasted with the completely totalitarian regime of the Soviet Union that preceded Lukashenko's term. Beginning in the time of Joseph Stalin,

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁶ A couple of examples:

⁷ The role that Huxley and Orwell assign to sexuality in their dystopias is diametrically opposed. Huxley's utopia much more accurately predicted the role that sexuality plays in today's techno-industrial system. We will return to this topic in the sections in which we talk about *Brave New World* and the current techno-industrial system. sexual permissiveness and permissiveness regarding expression and thought, destroys the possibilities of real freedom.[1704]

⁸ "The main concerns of the early environmental lobby groups, the World Wildlife Fund, Friends of the Earth and the Sierra Club, were wildlife or the disappearance of wilderness or undeveloped areas, and not It was not until the 1960s that scientific data brought to our knowledge that pesticides and other poisons had spread to penguins in Antarctica. The perceived threat no longer affected only wildlife; now it was believed that it constituted a serious and real threat to the whole world. It did not take long for another fusion to take place, between the left and the ecological philosophies. Industrial poisons were said to be the products of industries that cared only about profit. The left could then affirm that we were all victims of those old enemies of Marxism, the capitalists, and that now they not only exploited us but also poisoned us. Green intentions were further distorted when combined with those of highly respected anti-nuclear weapons organizations such as the Campaign for Nuclear Disarmament, CDN. Almost everyone agrees that using nuclear weapons in war is wrong, and this association of pacifist and environmental thinking was also behind the formation of Greenpeace." (*The Earth Runs Out* , page 237).

the government diverted the rivers that flowed into the Aral Sea to irrigate cotton crops, fully aware that this would ultimately result in the disappearance of the sea. The result was the biggest ecological disaster in history. In the remaining patches of water, once abundant fish populations have been almost completely wiped out, the seabed has been transformed into a toxic desert laden with concentrated pesticides and chemical weapons test residues.⁹ This is just one example of the contempt for the environment shown by the Soviet authorities, others being the mass killing of whales merely to meet production quotas,¹⁰ the Chernobyl nuclear disaster and the arrogant plans to divert the Siberian rivers using nuclear weapons to dig the canals.¹¹ This last project was abandoned in the Gorbachev era, when the Soviet Union abandoned totalitarianism. That this disdain for the environment is not unique to communism is demonstrated by the fact that both the plans to drain the Aral Sea and to divert the rivers of Siberia were hatched under the tsarist regime.¹²

The two Soviet successor states that inherited the Aral Sea provide a useful comparison of how different regimes act with respect to the environment. Two fragments of the sea still remain: the North Aral Sea in Kazakhstan and the South Aral Sea in Uzbekistan. Kazakhstan is an authoritarian regime¹³ similar to the governments of Belarus and Zimbabwe mentioned above; while Uzbekistan was - at least until the death of dictator Islam Karimov two years ago - a completely totalitarian state in which political dissidents were routinely executed, the president's own daughter ended up being

⁹ "You shouldn't feel guilty if you don't share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers' arguments refer to the world they know, the urban world. The real Earth doesn't need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now." (*The Earth Is Running Out*, page 31).

¹⁰ For example: "In that climate of opinion, it wasn't long before scientists seeking funding discovered that research that seemed to indicate that compound X or pesticide Y was carcinogenic was extraordinarily rewarding and brought them fame and fame. funds beyond what they could have imagined." (*Earth's Revenge*, page 166).

¹¹ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

¹² Examples:

¹³ Moreover, it could be argued, not without reason, that it is precisely the survival of the technological industrial society that could lead, in the future, to the human species (as well as to the rest of the wild species) to its extinction, at least as a product of evolution by natural selection. If some of the trends of current technological development are carefully studied (gradual transformation of humans into machines through prostheses and other technological devices, transformation of humans through artificial genetic modifications, greater automation of production processes, artificial intelligence, greater capacity of computers to correctly make decisions that humans used to make, increasing redundant labor, etc.), one could well conclude that there are more possibilities for the end of the human species to come with the survival of modern industrial civilization than with its end.

arrested and tortured, and at least one opponent of the regime was boiled alive.¹⁴ How have both regimes handled their shared ecological crisis? Kazakhstan built a dam to prevent further water escaping from the North Aral Sea, water levels are rising and fish stocks are recovering.¹⁵ Uzbekistan abandoned the South Aral Sea to its fate, there are oil and natural gas deposits under the seabed, letting the water drain will make it cheaper to extract them and the government believes that the deaths of thousands of people from Pesticide poisoning and total ecological collapse are a small price to pay to be able to do so.¹⁶

Other examples of totalitarian disregard for nature abound: China's environmental record is dismal,¹⁷ in North Korea during the 1990s, Kim Il Sung declared that "rice is socialism" and ordered the deforestation of the slopes of the country's mountains to make way for crops - the result was catastrophic soil erosion whose rectification, even today, the North Korean government is only beginning to consider.¹⁸ Linkola's argument that a totalitarian state is better for nature is therefore invalid.

Does this suggest that a "soft dictatorship" is a preferable form of state to both democracy and totalitarianism? No. The examples of "green dictatorships" I just gave are by no means universal: Russia has a similar political situation to Belarus and Kazakhstan,¹⁹ but the president, Vladimir Putin, shows no respect for the environment: openly welcomes climate change, believing that it will turn Siberia into a global

¹⁴ This sentence is incongruous. It should say "...it implies that everything we do is natural" or "...it implies that nothing we do is supernatural". It is probably a translation error, but since I do not have the original in English, I cannot be sure.

¹⁵ By "today", I mean that if in the future cars and other devices that consume fossil fuels work by total automation (without humans), then this sentence would not make sense. But, right now, it is clear that the industrial technological system needs vast numbers of human beings to function.

¹⁶ Lovelock himself unintentionally gives a clue as to why it would be best to take away modern technology from humans (for industrial civilization to disappear): "*Like photosynthesizers*[*]< em>, we couldn't have avoided getting to this overcrowded and unsustainable state. We are what we are and we could have done very little to avoid what now appear to be adverse changes; we shouldn't feel guilty about it" (*The Earth is Running Out*, page 88).

It refers to the mass extinction caused by the appearance and expansion of photosynthetic organisms within the geological period known as the Precambrian.

¹⁷ Lovelock's comparison of motor vehicle and termite nest could again be a mistranslation. The book contains a few notable translation errors (hard to believe in a popular science book), but since I don't own the original in English, I can't say for sure that this is a translation problem.

¹⁸ Some of those cognitive abilities found in other species, which have traditionally been considered exclusive to humans are: ability to solve new problems, ability to plan for the future, preparation and use of tools, culture, awareness and self-awareness, awareness of that others have a mind (premeditated deception), primary and secondary emotions, politics and a sense of justice. For a more detailed explanation and examples, see: Manuel Soler, *Adaptation of human behavior: understanding the human animal*, Ed. Síntesis, 2009. Chapter 11: The animal mind (pages 409-439).

¹⁹ I refer, for example, to: "Did humans cause a collapse in the ecosystem of ancient Australia?", fragment of "Extinct paleofauna of Australia. Rare creatures do not only live today", Mariano Magnussen Saffer, *Paleo*, Paleontological Bulletin, Year 4, n° 19, September 2006.

breadbasket.²⁰ (A Russian environmental economist told me that Putin was taking the radish by the leaf on this issue, since even if Siberia became warm enough for agriculture the soil would still be too light and acidic to support crops²¹). The aforementioned mismanagement that Poland was carrying out in the Bialowieza Forest has worsened as the country has slid towards more authoritarian rule in recent years.²² India's Prime Minister, Narendra Modi, has begun tearing up the democratic constitution, while also hacking away at the country's environmental protection laws.²³

All of the above suggests that there is little relationship between a regime's willingness to protect the natural world and how authoritarian or democratic it is. Linkola might still reply that he advocated a dictatorship built on the specifically green principles of population control, limited technology, and suppression of consumption noted above. This is where we can compare him with Kaczynski.

In *Anti-tech Revolution: Why and How*²⁴ Kaczynski outlines several principles that should guide potential revolutionaries. In chapter one, he argues that the development of a society can never be subjected to rational control. He cites various examples of the failure of social reform and political projects, such as Solon's attempts to eradicate serfdom in ancient Athens, the failure of programs for housing reform and social welfare in the United States, the ineffectiveness of the "Atoms for Peace" policy of the 1950s and 1960s in limiting the proliferation of nuclear weapons and the inability of Otto Von Bismarck to lead a unified Germany in the direction that he wanted. Kaczynski points out that power does not necessarily reside in a specific position, such as that of president or emperor, but is ultimately blurred in myriads of competing "individual wills." This would imply insurmountable obstacles to any sophisticated project of authoritarian green reform, such as that proposed by Linkola.

In chapter three of *Anti-Tech Revolution* Kaczynski states that revolutionary movements always end up corrupting as they gain power and influence, as more and more people join them merely for personal gain. He cites multiple examples of this: The French Revolution, which began with trying to establish a democratic government, turned into a dictatorship under the opportunistic Napoleon. The Bolsheviks in Russia yearned to create a radically egalitarian socialist society; Of course, the reality ended up being quite different. (Indeed, one might add that the Bolshevik revolution

²⁰ "A group of these early humans migrated to Australia at a time when the sea level was much lower than it is now and the journey by boat or raft was neither long nor difficult. From this group are descended the modern Australian Aborigines, who are often held up as examples of humans in a state of nature living in peace with the Earth. And yet his method of clearing land by fire may have destroyed the forests of the Australian continent as effectively as modern men did with chainsaws. May peace be with you Aborigines. Individually you are neither better nor worse than us. It's just that there are more of us and we have more resources." (*The revenge of the Earth*, page 209).

²¹ "Red pine" in the original. American Red Pine, *Pinus resinosa*. *N. from trans.*

²² Page 114.

²³ "Chipmunks" in the original. Rodents belonging to the genus *Tamias*. *N. from trans.*

²⁴ "Deadfalls" in the original. It refers to traps that act by crushing, causing a weight (a stone slab or a log) to fall on the animal. *N. from trans.*

was corrupted twice in reality, Stalin's rule has been described as a "revolution from above,"²⁵ albeit one that deviated greatly from the original ideals of the Bolshevik revolution. Bolshevik party. After Stalin's death this revolutionary program was also abandoned by Nikita Khrushchev.²⁷ By the time Brezhnev took command the Soviet Union was run by men who seemed interested in little more than looking out for their own benefit and preserving their power[28]). Both Christianity and Islam abandoned the austerity of Jesus and the original ideals of Muhammad as both faiths secured their control over vast empires.²⁶ To combat this, Kaczynski proposes that revolutionaries focus on a single clear goal, the achievement of which radically changes society and is irreversible once achieved. He cites the examples of the suffrage movement and the Irish and American struggles for independence.²⁷

How well does Linkola's program meet these recommendations? Linkola put forward several independent proposals: control demographics, limit consumption, and put a cap on technological development that would keep it at the levels of the late nineteenth or early twentieth centuries. As Linkola himself recognized, it is clear that this program requires a government to enforce it. As we can see, observing the examples of the Russian and French revolutions and other cases, such a government would end up perverting itself and would stop taking into account its original goals.

Linkola's policies are not irreversible either. He took as an example for his population control model the example of the Chinese "One Child" policy.²⁸ This policy has recently been abolished by the Xi Jinping government.²⁹ In reality this was never really a one-child policy to begin with, the one-child rule applied only in the cities, rural populations were always allowed to have two children, while the rule did not exist at all in the "autonomous regions" of China, such as Tibet or Xinjiang province. When the government discovered that parents were performing sex-selective abortions on fetuses or killing newborn girls because of their desire for a son, they allowed couples whose first child was a girl to try again for a baby. child.³⁰ This can hardly be considered a successful example to follow!

Linkola's goals also contradicted each other, he wanted to reduce technological development to late Victorian or Edwardian levels, yet he also demanded a world government that would enforce its policies globally. Leaving aside the fact that the Ed-

²⁵ "Sweat lodge" in the original. *N. from trans.*

²⁶ "DNR" in the original. "Department of Natural Resources". *N. from trans.*

²⁷ "Rat wall" in the original. Refers to a buried wall around the foundation that prevents rodents from burrowing under the construction. *N. from trans.*

²⁸ "National forests" in the original. *N. from trans.*

²⁹ "Buckskin" in the original. Name given especially to deer skins ("buck") tanned without hair and with primitive techniques. *N. from trans.*

³⁰ "Wilderness way" in the original. "Wilderness" is a term that lacks a simple translation in Spanish. It usually refers to ecosystems or areas that are not very humanized (wild), but sometimes it can be loosely translated as "wild nature". Let us remember, on the other hand, that this article was written especially to be published in the magazine *Wilderness Way*, that is, the author is winking at the readers of the magazine. *N. from trans.*

wardian and Victorian societies were already very ecologically destructive, it is clear that a world government with the level of control envisioned by Linkola would need highly advanced technology in order to function; It probably couldn't work even at today's level of technology, let alone at the late 19th or early 20th century. Linkola also suggested that a single child per couple would be the average for a given population, and that reproductive rights should be assigned based on eugenic principles.[34] This would again require sophisticated technology to monitor populations and decide who would be suitable for breeding.

Consequently, a world dictatorship that took Linkola's ideas as a guide would be likely to end up perverting itself and abandoning its own goals as they came into conflict with each other and its main objective - population control - would be easily reversible.

On the contrary, Kaczynski points out that destruction is easier than creation, and it is not easily reversible. It also points to the techno-industrial system as the main driver of ecological degradation.³¹ Most of the ecological damage caused in the world would not be possible without modern technology, the excess of consumption against which Linkola rightly cried out is made possible precisely by technology. The destruction of this system is a clear and unique goal that is not easily reversible and, in fact, may not be reversible at all. Even if an anti-technology revolution claimed the lives of every single anti-technology revolutionary, the destruction of the stock of knowledge and infrastructure would be so immense that the task of re-establishing the techno-industrial system would take centuries. and, since the readily available resources that made the first industrial revolution possible have already been fully used, it may well be that a second industrial revolution will never take place.[36] By contrast, a revolution that installed a Linkola-style regime would be constantly susceptible to being subverted and reversed, both by its own ranks and by opponents outside of them.

There are those who say that Linkola was simply a fascist who used environmentalism as a smoke screen for his authentic ideology.³² I do not agree with them. It seems to me that he was a sincere and unconditional lover of nature and wild ecosystems, just like Kaczynski is. I share the passion of both. However, Linkola's proposals are basically unworkable and counterproductive.

³¹ "Wise-use movement" in the original. The "Wise Use" movement arose in the United States in the 1980s as a pressure group and social movement in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. *N. from t.*

³² "Between villages there is a death zone" in the original. *N. from t.*

Grades:

1. Mika LaVaque-Manty, *Arguments and Fists: Political Agency and Justification in Liberal Theory*, Routledge, 2002, p. 159.

2. “Any dictatorship would be better than modern democracy. There cannot be a dictator so incompetent that he shows more stupidity than most people. The best dictatorship would be one in which lots of heads rolled and the government prevented any economic growth”:

[http://www.penttilinkola.com/pentti_linkola/ecofascism/][<http://www.penttilinkola.com/penttilinkola/ecofascism/>]

3. George C. Schoolfield (ed.), *A History of Finland's Literature*, University of Nebraska Press, 1998, p. 271.

4. [http://www.penttilinkola.com/pentti_linkola/ecofascism/][<http://www.penttilinkola.com/penttilinkola/ecofascism/>]

5. See Jared's Diamond, *Collapse*, chapter 11 (page unknown).³³

6. “Joaquín Balaguer ... recognized that the country urgently needed to preserve forests, watersheds, and the supply of water. He banned all commercial logging and closed all of the sawmills. Many people fought back and would operate their sawmills at night illegally. Then Balaguer took steps even further by enforcing his policies with the help of the military. Night raids were made on logging camps along with gunfire killing people while the lucky ones were imprisoned.” JFord3, “Group B #2 post: Balaguer an evil or the future?”, *Envproblems*, February 3, 2016:

[<https://envproblems2016.umwblogs.org/2016/02/03/group-b-2-post-balaguer-an-evil-or-the-future/>][<https://envproblems2016.umwblogs.org/2016/02/03/group-b-2-post-balaguer-an-evil->][<https://envproblems2016.umwblogs.org/2016/02/03/group-b-2-post-balaguer-an-evil-or-the-future/>][[or-the-future/](https://envproblems2016.umwblogs.org/2016/02/03/group-b-2-post-balaguer-an-evil-or-the-future/)]. See also Jared's Diamond, *Collapse*, chapter 11.[c]

7. “During the four years between 2016 and 2019, a total of 32 suspected poachers have been killed in armed clashes with guards [...] As of [2013], the government has stepped up anti-poaching activities , with agents employing the latest technologies such as drones in the fight against this threat.” “Nine Poachers Shot Dead Last Year”, *ZimEye*, 26 January 2020:

[<https://www.zimeye.net/2020/01/26/nine-poachers-shot-dead-last-year/>][<https://www.zimeye.net/2020/01/26/nine-poachers-shot-dead-last-year/>]

8. See “Belarus”, *Freedom House*:

[<https://freedomhouse.org/country/belarus/freedom-world/2020>][<https://freedomhouse.org/country/belarus/freedom-world/2020>].

9. See, for example, UNESCO, “State of Conservation of 'Bialowieza Forest'”, 2017 and 2019: [<https://whc.unesco.org/en/soc/3614/>][(<https://whc.unesco.org/en/>)]

³³ Examples:

soc/3614/]and[<https://whc.unesco.org/en/soc/3903>][<https://whc.unesco.org/en/soc/3903>]].

[b] There is an edition in Spanish: *Colapso*, Ramdom House Mondadori, 2005. The reference corresponds to pages. 452-453 of the 2007 Spanish reissue of the same publisher. *N. from t.*

[c] Pgs. 449-450, of the previously cited Spanish edition. *N. of t.*

10. See, for example, the video: “The Aral See: The Toxic Soviet Era”, Geographies (YouTube channel), February 13, 2020, Simon Whistler (host), Morris M. (author):[<https://www.youtube.com/watch?v=xEl4OojA3Y>][<https://www.youtube.com/watch?v=xEl4OojA3Y>].

11. Alex Tabarrok, “Why the Soviets Slaughtered 180,000 Whales during the Cold War,” *FEE*, May 23, 2019:[<https://fee.org/articles/why-the-soviets-slaughtered-180-000-whales-during-the-cold-war/>][<https://fee.org/articles/why-the-soviets-slaughtered-180-000-whales-during-the-cold-war/>]

12. Frederic Golden, “Making Rivers Run Backward”, *TIME*, June 14, 1982. See also “Northern river reversal”, in *Wikipedia*:

[https://en.wikipedia.org/wiki/Northern_river_reversal][https://en.wikipedia.org/wiki/Northern_river_reversal].

13. The cited *TIME* article mentions that the project to divert the Siberian rivers was originally conceived in 1830, while the video “The Aral See: The Toxic Soviet Era” mentions that the Tsarist scientist Aleksandr Voeikov considered that the Aral Sea was a “useless evaporator” and defended its destruction. (At minute 5:43 of the video).

14. See “Kazakhstan”, *Freedom House*:

[<https://freedomhouse.org/country/kazakhstan/freedom-world/2020>][<https://freedomhouse.org/country/kazakhstan/freedom-world/2020>].

15. See “Uzbekistan”, *Freedom House*:

[<https://freedomhouse.org/country/uzbekistan/freedom-world/2020>][<https://freedomhouse.org/country/uzbekistan/freedom-world/2020>]; on the torture and killing of dissidents, see “Uzbekistan: Two Brutal Deaths in Custody,” *Human Rights Watch*, August 9, 2002:[<https://www.hrw.org/news/2002/08/09/uzbekistan-two-brutal-deaths-custody>][<https://www.hrw.org/news/2002/08/09/uzbekistan->][<https://www.hrw.org/news/2002/08/09/uzbekistan-two-brutal-deaths-custody>][[two-brutal-deaths-custody](https://www.hrw.org/news/2002/08/09/uzbekistan-two-brutal-deaths-custody)]; and on repression against president’s daughter, see: Natalia Antelava, “Suspected Gulnara Karimova letter smuggled to BBC”, BBC, News, 24 March 2014:[<https://www.bbc.co.uk/news/magazine-26713383>][<https://www.bbc.co.uk/news/magazine-26713383>].

16. See the video mentioned above:

[<https://www.youtube.com/watch?v=xEl4OojA3Y&t=380s>][<https://www.youtube.com/watch?v=xEl4OojA3Y&t=380s>]. See also Dene-Hern Chen, “The country that brought a sea back to life”, BBC, Future, 23rd July 2018: [<https://www.bbc.com/future/article/20180719-how-kazakhstan-brought-the-aral-sea-back-to-life>][<https://www.bbc.com/future/article/20180719-how-kazakhstan-brought-the-aral-sea-back-to-life>]

[<https://www.greeneuropeanjournal.eu/whats-the-matter-with-poland/>][<https://www.greeneuropeanjournal.eu/whats-the-matter-with-poland/>.]

24. See Swansy Afonso, Rajesh Kumar, and Debjit Shakraborty, “Modi govt’s environment rules overhaul sparks fears of return to grim past,” *Business Standard*, September 9, 2020:[https://www.business-standard.com/article/current-affairs/pm-modi-s-overhaul-of-environment-rules-sparks-fears-of-return-to-grim-past-120090900244_1.html][https://www.business-standard.com/article/current-affairs/pm-modi-s-overhaul-of-environment-rules-sparks-fears-of-return-to-grim-past-120090900244_1.html][https://www.business-standard.com/article/current-affairs/pm-modi-s-overhaul-of-environment-rules-sparks-fears-of-return-to-grim-past-120090900244_1.html] Haris Zargar, “India’s Modi dismantles environmental safeguards”, *New Frame*, July 30, 2020:[<https://www.newframe.com/indias-modi-dismantles-environmental-safeguards/>][<https://www.newframe.com/indias-modi-dismantles-environmental-safeguards/>] and Hannah Ellis-Petersen, “India plans to fell ancient forest to create 40 new coalfields,” *The Guardian*, August 8, 2020: [<https://www.theguardian.com/world/2020/aug/08/india-prime-minister-narendra-modi-plans-to-fell-ancient-forest-to-create-40-new-coal-fields>][<https://www.theguardian.com/world/2020/aug/08/india-prime-minister-narendra-modi-plans-to-fell-ancient-forest-to-create-40-new-coal-fields>][<https://www.theguardian.com/world/2020/aug/08/india-prime-minister-narendra-modi-plans-to-fell-ancient-forest-to-create-40-new-coal-fields>] On Modi’s authoritarianism, see < em>Arundhati Roy, “Modi’s brutal treatment of Kashmir exposes his tactics - and their flaws”, *The Guardian*, August 5, 2020:

[<https://www.theguardian.com/commentisfree/2020/aug/05/modi-brutal-treatment-of-kashmir-exposes-his-tactics-and-their-flaws>][<https://www.theguardian.com/commentisfree/2020/aug/05/modi-brutal-treatment-of-kashmir-exposes-his-tactics-and-their-flaws>][<https://www.theguardian.com/commentisfree/2020/aug/05/modi-brutal-treatment-of-kashmir-exposes-his-tactics-and-their-flaws>].

25. Theodore John Kaczynski, *Anti-Tech Revolution: Why and How*, First Edition, Fitch & Madison, 2016.

26. Robert C. Tucker, *Stalin In Power: The Revolution From Above, 1928-1941*, WW Norton, 1990.

27. See Khrushchev’s Secret Speech, ‘On the Cult of Personality and its Consequences’, given at the Twentieth Congress of the Communist Party of the Soviet Union, February 25, 1956, Wilson Center Digital Archive: [<https://digitalarchive.wilsoncenter.org/document/115995.pdf?v=3c22b71b65bcbb9fd9419c995>][<https://digitalarchive.wilsoncenter.org/document/115995.pdf?v=3c22b71b65bcbb9fd9419c995>][<https://digitalarchive.wilsoncenter.org/document/115995.pdf?v=3c22b71b65bcbb9fd9419c995>]

28. See *Wikipedia*, “Nomenklatura”:[<https://en.wikipedia.org/wiki/Nomenklatura>][<https://en.wikipedia.org/wiki/Nomenklatura>] and Moshe Lewin , “Soviet

Bureaucracy in Historical Perspective”, The National Council for Soviet and Eastern European Research, *Title III Program*, 1996: [<https://www.ucis.pitt.edu/nceer/1996-810-13-Lewin.pdf>][<https://www.ucis.pitt.edu/nceer/1996-810-13-Lewin.pdf>]

29. *Anti-Tech Revolution: Why and How*, pp. 98-99.

30. *Ibid.* p. 102-108.

31. Pentti Linkola, *Can life prevail?*, Arktos, 2011, pp.185-186.

32. See Tom Phillips, “China ends one-child policy after 35 years”, *The Guardian*, 29 October 2015:[<https://www.theguardian.com/world/2015/oct/29/china-abandons-one-child-policy>][<https://www.theguardian.com/world/2015/oct/29/china-abandons->][<https://www.theguardian.com/world/2015/oct/29/china-abandons-one-child-policy>][one-child-policy.]

33. See the *Encyclopaedia Britannica*, entry “One-child policy”:
[<https://www.britannica.com/topic/one-child-policy>][<https://www.britannica.com/topic/one-child-policy>](According to the last correction of May 12, 2020).

34. Pentti Linkola, *Can life prevail?*, p.186.

35. See Ted Kaczynski, *Industrial Society and its Future*, *Anti-tech Revolution: Why and How* and *Technological Slavery* (Fitch & Madison, 2019).

36. “If the system were completely destroyed, the effects would be -at least for a long time- irreversible, since a new technological system would take several hundred years or more to develop. Some people even believe that a technological system could never be created on Earth again. Kaczynski, *Anti-Tech Revolution: Why and How*, pp.124-125. See also note 162, p. 133.

37. See, for example, Evangelos D. Protopapadakis, “Environmental Ethics and Linkola’s Ecofascism: An Ethics Beyond Humanism”, *Frontiers of Philosophy in China*, 9(4), December 2014:

[http://scholar.uoa.gr/sites/default/files/eptopa/files/25._evangelos_d._protopapadakis_environmental_ethics_and_linkolas_ecofascism_an_ethics_way_beyond_humanism.pdf][http://scholar.uoa.gr/sites/default/files/eptopa/files/25._evangelos_d._protopapadakis_environmental_ethics_and_linkolas_ecofascism_an_ethics_way_beyond_humanism.pdf][environmental ethics and linkolas ecofascism. an ethics way beyond humanism.pdf]

THE DECLINE OF THE INTEGRAL WORLD: the Integral Theory and the disintegration of the Industrial Civilization[a]

By Tomislav Markus

In the previous article [<http://www.naturalezaindomita.com/dos-caminos-divergentes>][“Two divergent paths”] I explained the inadequacy of the Integral Theory as a theoretical approach, due to its incompatibility with modern science. Here I will try to show that the Integral Theory cannot do a good job on a practical level either -as spiritual therapy. First, however, I have to say something about the depth of the crisis of industrial civilization in a historical context, a problem rarely mentioned in the pages of Integral World to date.

Hunter-gatherer societies are the only truly sustainable long-term society, not because of any kind of “goodness,” but because of a genetic adaptation to this form of social organization. Hunter-gatherers intervened in the natural world - mainly through hunting and the use of fire - but it always remained the wild natural world or our natural evolutionary context. In the worst cases, some hunter-gatherer groups - such as in Australia around 50,000 years ago or in North America around 12,000 years ago - may have wiped out several species of megafauna. We don’t know for sure due to the paucity of archaeological evidence, but even if true, it would not have been of great ecological importance in a multi-million year context (20-30 species disappear today only every few hours).).

With Neolithic domestication began the continuous destruction of habitats (mainly forests and wetlands) and wild species, soil erosion and a constantly increasing simplification of biodiversity. Population increase was the primary cause of ecological destruction in agricultural civilizations and, in certain cases (Classical Maya, Sumerians, Roman Empire, etc.), caused or contributed significantly to the decline and collapse of these complex societies. The periodic alternation of demographic expansion and collapse was a typical feature of complex agricultural societies.¹

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

Wood and the work done by living things (humans and domestic animals) were the main sources of energy in agricultural civilizations. Thus, the vast majority of the population had to live as peasants and only between 5% and 10% of the population lived in an urbanized environment - cities and large towns. Industrial societies, with massive urbanization and mechanization, have been created in the last 200 years through the discovery and exploitation of new energy resources: coal as the main engine of the first industrial revolution and oil and gas as engines of the second revolution. industrial. Fossil fuels were the main factor in the creation of industrial civilization in the 19th and 20th centuries.² Faith in "historical progress" - the fundamental metanarrative of all modern secular ideologies (and also typical of Integral Theory) - was created due to the discovery of the New World, but became widespread due to the

[a] Translation by Último Reducto from "Twilight in the Integral World: Integral Theory and the Disintegration of Industrial Civilization", published in Integral World (2009): [<http://www.integralworld.net/markus3.html>][<http://www.integralworld.net/markus3.html>]. *N. t.* new sources of energy. The entire industrial megastructure was built on fossil fuels.

Energy - and in industrial society this means fossil fuels. It is not, as economists believe, an aspect of the economy or any one resource among many others, but the basis of the entire economy and the fundamental resource to obtain all the others. Oil and other fossil fuels are the lifeblood of the industrial economy and all major activities: manufacturing, transportation, agriculture,³ industrial and mass production, tourism, military, mining, electricity production, etc. Without them nothing can work. The golden age of neoliberal globalization, from the 1980s and 1990s until recently, was made possible only because of the constant flow of energy in world trade.

Fossil fuels are not renewable energy sources and, since the 1920s, there have always been those who warned that they would eventually run out, especially oil. However, the discovery of new oil fields grew steadily, with a large discovery first in North America in the 1920s and 1930s and then in the Middle East after the 1950s. The peak of discoveries was in the 1960s. And while there were some big discoveries later, like the North Sea in the 1970s, the pace of discovery has been steadily slowing down. The American geologist King M. Hubbert predicted in 1956 that peak oil⁴ for the United States (for the contiguous 48 states) would occur in 1970 - as it did. Hubbert predicted the peak of world oil production for the year 2000, but nobody listened to him and he

² Original title: *The Vanishing face of Gaia*.

³ Term coined by Lovelock himself to define his work on Gaia theory. The "geo" for the Earth and the "physiologist" because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

⁴ An example: "You may have noticed that I use the metaphor of 'The living Earth' when talking about Gaia, but I don't mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny." (*Earth's Vengeance*, page 38).

died in 1989, in oblivion. The first (1973) and second (1979) oil crises clearly showed the great vulnerability of the "advanced" industrial society in terms of oil imports, mainly from the Middle East, and that the dependence was growing steadily. . The US imported about 30% of its oil in the 1970s, and today it imports about 70%.⁵

The first and second oil crises caused great problems and disruptions in the normal functioning of Western economies, but their effect did not last long because they were caused by political factors - the Arab embargo and the Iranian revolution - that changed rapidly. The discovery and exploitation of two large oil fields in the North Sea and Alaska starting in the 1970s also eased the situation and helped overcome the energy crisis. However, it was a first warning of what was to come. From 1985 to 2002, the average price of oil was between 15 and 20 dollars/barrel (d/b): this was the basis for the so-called information revolution to take place. After 2002, the price was continuously increasing, with small fluctuations, until the summer of 2008. In that period the average price of oil was 70 d/b and even higher if we take into account only the period 2006-2008. The big rise in oil in 2007-2008, with a price of 148 d/b at the beginning of the summer of 2008, was caused in part by speculation in the stock market, but only due to expectations that demand would occur every greater time.

In the last 15 or 20 years there has been one last industrial revolution in China, India and some other "developing" countries. Demand grew rapidly but supply grew much more slowly, especially after 2004. At the end of 2004, world production of all liquid fuels (petroleum, natural gas, and methanol) was about 87.2 million barrels. . This is the so-called peak[b] plateau, when world production remains more or less constant and cannot be increased significantly, no matter how high prices are. Unlike the first and second oil crises, which were caused by artificial scarcity, the third was caused by objective geological limits. OPEC[c] was controlling oil prices from the 1970s until around 2002 and Saudi Arabia was one of the so-called determining (crucial) producers, however in recent years this has ceased to be the case.

The main cause of the current economic crisis was a large increase in the price of oil - the economy cannot function normally without cheap and abundant energy - and the only question is what caused this increase. The facts tell us that the main reason was an increasingly unfavorable relationship between growing demand and stagnant supply. Some authorities, such as the International Energy Agency (IEA)[d], think that the main reason for the third oil crisis was the lack of investment (in tankers, drilling technologies, refineries, etc.) in the period from 1985 to 2002 due to low oil prices. This is the opinion of many analysts, especially those who work within the oil industry or in certain pro-government agencies, such as the IEA or CERA[e] (Mills 2008, Yergin 2008). However, this does not explain the lack of investment after 2002, when oil prices were rising. The oil companies know that the available oil reserves (that is, suitable for an extraction whose relationship between "energy produced and energy invested"

⁵ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

or TRE[f] is favorable) are much smaller than what is officially stated and that the large investments will not be worth it. In the oil industry, investments may start to pay off after ten years or more, but ten years from now there will be (much) less oil than today, so there are no big investments.

For conventional economists - merely academic intellectuals with some degree of political influence - the basis of the economy is money, not energy. So his advice to governments is often: inject money into the banking system, offer stimulus packages and bailouts, implement strong fiscal policies and the economy will recover. This is, they believe, just another "recessive cycle," perhaps a little stronger and longer than usual. These measures may produce some short-term effects, such as a very limited revival of economic activity for a few months, but in the long term they lead nowhere. They only create new problems, such as the huge threats of a collapsing dollar and a deficit bubble that can easily burst and lead to a rapidly worsening economic crisis.

Right now, we are in the midst of the first (introductory) phase of a mega-crisis, in which world oil production is holding steady. In the coming years we can expect a worsening of the crisis with an even greater increase in unemployment and a drop in demand due to the high price of oil (around 70 d/b is the minimum acceptable price for OPEC). The second phase will start when

[b] "Peak plateau" in the original. *N. from t.*

[c] "OPEC" in the original. "Organization of the Petroleum Exporting Countries", Organization of Petroleum Exporting Countries. *N. of t.*

[d] "International Energy Agency (IEA)" in the original. *N. of t.*

[e] The author is probably referring to "Cambridge Energy Research Associates". *N. from t.*

[f] "EROEI, 'energy returned over energy invested'" in the original. It refers to the so-called in Spanish "Energy Return Rate". *N. t.* production starts to fall at the end of the peak plateau, slowly at first, then faster, probably after 2012, maybe even sooner, depending on demand and OPEC's ability to compensate the continuous fall in the production of non-OPEC countries. This will be the beginning of a real crisis with a massive increase in unemployment, inflation and prices, regardless of demand. Mass discontent, strikes and unrest in the streets are a very real possibility in the next couple of years, since without the constant supply of cheap (or not too expensive, as now) energy, the big cities are barrels. of gunpowder.

In a more distant future, after 2020, we can expect a real disintegration of industrial societies and processes of demographic (population decline) and social collapse (decrease in political, technological and economic complexity). In 2030, world oil production will be half that of 2008, with some 8.5 billion human beings, a not very rosy picture anyway. This is not apocalyptic thinking or a belief in doomsday, but yet another case of the collapse of a complex society, one among many that have occurred throughout recent human history and are the subject of frequent scientific study. ⁶

⁶ A couple of examples:

Peak oil also means peak population, which will grow over the next few years to just over 7 billion, and then begin to fall. The recent drop in oil prices will be paid for by a decline in future supplies (oil shortage 3-4 years from now) as many oilfield discovery and investment projects are being cancelled. Economic activity may pick up a bit in the short term (during the summer of 2009) due to government fiscal policies (bailouts, stimulus packages, etc.) but no real long-term recovery can be achieved without a return to era of abundant and cheap energy. However, where will this energy come from?

Most people - the public, the mass media, political and economic elites - are not aware of how serious the situation of humanity is. There is widespread belief either that oil reserves are vast or that we will be able to develop alternative energy sources just in time to "give up oil before oil gives up on us." New US President Barack Obama's program for "clean energy" and "clean technology" enjoys wide-ranging support and popularity, both inside and outside the United States. The so-called transition cities in New Zealand, the United States and several other countries are part of these wishes and plans. However, all this constitutes a huge mirage and a symptom of faith in technological miracles, a very frequent phenomenon in industrial society. Unfortunately, there are no "alternatives".

The so-called alternative energies -nuclear, solar, geothermal wind energy, etc.- are only electricity production technologies. Technology is not energy and "alternative" energies are nothing more than derivatives of fossil fuels. This means that we must have vast amounts of cheap oil and natural gas to develop alternative technologies, but because of peak oil, we don't. It takes "petroleum energy" to produce "alternative energy." In the post-Peak Oil world the development of "alternatives" will see a huge increase in demand for oil and gas, the price will rise and the economy will either crash or sink into an even deeper recession. The development of "alternative" energies is possible only through constant economic growth, but the fundamental precondition for this is cheap energy – and so we are back to square one. "Alternative" forms of energy simply cannot replace the 30 million barrels of oil a year (the "net energy" problem).

There are also other problems associated with "alternative" energies. To begin with, its difficult to capture, since the sun, the wind or the water simply are not in the subsoil as is the case with oil, natural gas or coal, they are not always available and depend a lot on the climate (which is changing rapidly). And nuclear power, which can only produce larger amounts of electricity, is too expensive and too dangerous (terrorism, weapons, waste). Second, there is simply no time for such a massive energy transition. The first oil crisis (1973) was a good opportunity (wasted) to have started an energy transition, since it would last between 30 and 50 years approximately. The widening gap between supply and demand for the next 20 years or so cannot be closed by combining all other energy sources. Investing in "alternative" energies means wasting money.[974] So the era of cheap energy will not return and without it there will be no long-term recovery. Conventional economists are simply not able to understand this

because for them scarcity of resources is not possible. If prices rise, either production will increase or alternatives will quickly be found. However, neither option is possible today.

The current crisis of industrial civilization and its gradual disintegration process have very serious implications for the Integral Theory. Basically, the Integral Theory can be understood as the defense of an “enlightened” or “spiritual” version of neoliberal globalization and global industrial civilization. That is to say, in reality integral theorists are not apologists of the mass consumer society,[975] of rampant capitalism and free market fundamentalism, of military adventures, of fanatical ideologies (religious or secular), of intolerance towards other nations or races, nor of any other similar collective pathology.

The Integral Theory has much to say about these and other problematic behaviors of today’s industrial societies. The ideal of the Integral Theory is a “new civilization” or an “integral global village” without war, ecological destruction or great inequalities and with peace, stability, prosperity and equality between and within nations. In this new civilization, prosperity and well-being will not be understood as thoughtless consumption but as reaching some kind of “spiritual enlightenment ” and a “higher level of consciousness.” A “moderate” modernism that should preserve the “positive aspects” of “modernity” together with the “enlightened” values of the “New Paradigm”. It seems that there is now some hope that we are entering a new (informational?) age.[976] This is the main reason why Wilber’s Integral Theory, and Integral Theory in general, is able to attract so many followers: it offers them criticism of many bad phenomena in today’s society (it is not an apology for the “end of the history” like Fukuyama’s), but maintains faith in the fundamental modern narrative: history has a meaning despite everything, it is not just a meaningless struggle of civilized human beings with anthropic problems.

Historical, social and technological progress + personal spiritual enlightenment - who could be against this? Unfortunately, however, science does not accept wishful thinking or personal desire.

Here we can avoid the questions: “Is the Integral Theory a realistic option?” and “Is there any hope that members of the middle class of urban-industrial society will achieve ‘spiritual enlightenment’?” The fundamental problem is another. In a previous article (Markus 2009) I wrote about “The Limits of Spiritual Enlightenment”, and in it I took it for granted that industrial society would continue to exist. However, what if this society had no future? Integral theorists take for granted the continuity of industrial society⁷ and promote a “progress of consciousness” among its citizens (mainly among

⁷ “You shouldn’t feel guilty if you don’t share that nonsense [belief in the feasibility and goodness of renewable energy]: A closer look reveals this to be a complex scam in benefit of a few nations whose economies are enriched in the short term by the sale of wind turbines, biofuel plants and other equipment for seemingly green energy. Do not believe for a moment the story that they are going to save the planet. The sellers’ arguments refer to the world they know, the urban world. The real Earth doesn’t need saving. It can, will, and always has saved itself, and now it is beginning to do so by changing to a much less

members of the urban middle class). Meeting the material needs of most members of "advanced" societies is taken for granted. If the scenarios mentioned above - about the collapse of industrial mega-structures in the near future - turn out to be correct, the Integral Theory is meaningless and its goals lead nowhere. If the lack of connection with the natural and social sciences supposes the failure of the Integral Theory as a scientific project, the collapse of industrial society supposes its failure as a practical project. The Integral Theory is, in this sense, just another idealistic attempt to correct problems that are based on material circumstances (ecological and geological, but also biological -lack of genetic adaptation, see my previous article, "Two divergent paths"-).[eleven]

In other words, it does not matter too much how high the "level of consciousness" or "spiritual enlightenment" of members of industrial societies may become if their way of life is not sustainable. No matter how "enlightened" and "rational" they may be, men and women continue to be members of an outdated urban-industrial megastructure, dependent on an economy based on fossil fuels. The message of Integral Theory can be attractive to educated members of industrial society as long as - and only as long as - this society is still relatively stable and secure, with a continuously growing internal economy and a constant supply of vital resources from abroad. However, this era is more or less coming to an end. Of course, integral theorists may think that the thesis of the collapse of industrial society is simply "apocalyptic thinking" and "hysteria" and that it is wrong - although, in fact, even if it were wrong, it would be a legitimate scientific problem - but they cannot ignore the problematic and relevant literature on the matter.

There is not a single article in the Journal of Integral Theory and Practice (14 issues to date) about the energy crisis and peak oil. In general, it is surprising how little most integral -M theorists do. Zimmerman and S. Esbjorn - Hargens would be honorable exceptions - have to say about the so-called ecological crisis, from climate change to the sixth great extinction. Nor, at least for now, do they say anything about the most important event and process of our time (of peak oil and the end of the age of cheap fossil fuels, and the end of the age of fossil fuels and the disintegration of industrial civilization, respectively). They are totally oblivious to the question of energy. A great book, *Integral Ecology*, which has been published in spring 2009, has no entries at all for "energy", "fossil fuels" or "peak oil" in its index (Esbjoern- Hargens and Zimmerman 2009). Obviously, these are not important issues for "integral ecology".

Integral theorists probably think that the main cause of our mega-crisis is "greed" or "lack of enlightenment", but these cannot explain why a system is in perfect condition one day and in big trouble the next (greed). it's always there, and the banks and stock markets are always trying to make a profit, but, in good times, this is called "success"). Some comprehensive theorists may mention the vulnerability and fragility

favorable state for us and other animals. What people mean by that petition is 'let's save the planet we know,' but that's impossible right now.' (*The Earth Is Running Out*, page 31).

of market economies, but without mentioning peak oil or any other energy constraints (McIntosh 2007).⁸ Integral theorists are probably enthusiastic about “alternative” energies, especially renewables, but, as we have already seen, it is not a realistic option. They normally think that technology is neutral and that its correct use depends on the moral and spiritual capacities or the human “level of consciousness”.⁹

In the near future, there is a place for integral theorists but only if they abandon their increasingly obsolete progressive[h] and idealistic ideas about an “enlightened/enlightened” industrial civilization, world government, “progressive evolution”, etc. In the post-peak oil world - or in the second phase of the fossil fuel age - true enlightenment can only mean recognition of the “perfect storm” (the end of the fossil fuel age + climate change), water scarcity and other relatively minor problems) in which industrial civilization will disappear.

True enlightenment may mean helping people prepare for a demographic and social collapse in the next 20 to 40 years and contributing to a less painful societal transition to a post-industrial society. This is not something small or insignificant. Integral theorists -and other critical independent thinkers- can criticize the official ideology of industrial society that identifies consumerism with well-being, technological innovation with progress, medicine with health, standard of living with quality of life, etc. In this way, to people the collapse of industrial society will not seem like a great tragedy or a catastrophe, but only the disappearance of an unnatural order[977] and an opportunity to build, not a utopia but a more natural society, more in line with the evolution of human nature and with its fundamental needs.

GRADES

1. There is an enormous literature on ecological (or environmental) history. See: Hughes 1975, 2001, 2006, Redman 1999, McNeill 2000, Chew 2001, 2006, Diamond 2008, and Ponting 2007. I have already written about the ecological history of human societies in a long article in Croatian [<http://www.isp.hr/~tmarkus/>](www.isp.hr/~tmarkus/). Wilber and other integral theorists know nothing about this important problem. Wilber has often suggested that the so-called ecological crisis is something modern, a consequence of “industrial ontology” or the dominance of “flatland”[j]. However, what about the terrible ecological state (and the innumerable other anthropic problems) of agricultural civilizations in which there was no “flatland” or “modern science”? In these societies the dominant approach in their “high culture” was the perennial tradition[k], something completely different from modern science, but the fundamental anthropic problems were more or less the same. This should not surprise us if we take into account the theory of biosocial discontinuity. Ecological and other

⁸ In this regard, see *The Industrial Society and its Future*, Ediciones Isumatag, pages 67-69.

⁹ Examples:

anthropic problems are the main feature of all complex societies, since civilization is an unnatural order, rootless in our evolutionary past.

2. At the world level, the main source of energy in the 19th century was still firewood and in the 20th century it was coal.

3. In essence, the so-called green revolution - the main cause of the population explosion over the last 100 years - has consisted of nothing more than the invention of a way to transform oil and natural gas into food. Traditional organic farming can only feed between 1,000 and 1,500 million people at most; and probably, in the near future, much less due to climate change, water scarcity, soil erosion, desertification and other problems.

4. Peak Oil means the maximum amount of oil ever extracted or approximately 50% of all existing oil, in a given region or country or globally. For example, peak oil for the North Sea was reached in 1999, for Russia in 2007 and for Saudi Arabia in 2005 - the latter being two of the largest exporting countries in the world. All the concrete data can be found on relevant Internet pages, especially Wikipedia.org and Energybulletin.net and in some books that offer good overviews (Heinberg 2005, Catton 2009, Rubin 2009). The first half of the extracted oil was the best quality and the easiest to extract. Peak oil marks the end of the first (upward) phase of the fossil fuel era and we are now at the beginning of the second (downward) phase. Peak oil is simply the most important event of our time and the end of the fossil fuel age is the most important process in it. Here I cannot talk about many of the other great problems of current civilization, such as climate change (a much slower effect and with many uncertainties), the scarcity of fresh water, soil erosion, the sixth great extinction, new diseases, etc. (The much publicized "terrorism" is only a small disturbance, not very important). Richard Heinberg (2007, 2009b) says that Peak Oil is "the Peak of Everything's first line of advance"[979].

5. For the energy history of human societies and modern fossil fuel use, see: Price 1995, Heinberg 2004, 2005, Crosby 2006, Kunstler 2006, Homer and Dixon 2006, Dekanis 2007, Greer 2008, and Engdahl 2008.

6. Tainter 1988, Caldararo 2004, Diamond 2008, and McAnany-Yoffee 2009. On possible scenarios and the future of industrial societies, see: Heinberg 2004, Kunstler 2006, Greer 2008, Smil 2008, Holmgren 2009, Catton 2009, and Rubin 2009. A great advantage of the peak oil theory is that it can be tested and disproved, since even future scenarios belong to the very near future.

7. Many authors write about the problems of "alternative" energies. See: Heinberg 2005, Kunstler 2006, Burr 2008, Greer 2008, Catton 2009, and many Internet articles.

8. The criticism of consumerism, widely spread among thinkers with very different opinions, has always had several internal problems, such as: what about the many jobs that depend on mass consumption? Or: what will people get instead of a high standard of living? Today, however, these problems are obsolete, as the consumer society - another product of the era of cheap and abundant energy - will not be able to survive peak oil for long. The demise of mass consumerism will be caused by peak oil

- or, seen more broadly, the end of the fossil fuel era - not by "spiritual enlightenment" or "perennial wisdom."

9. Wilber 2000, 2006, Hollick 2006, Laszlo 2006, 2008, Reynolds 2006 and McIntosh 2007. In fact, the "new civilization" would not be so new, it would be just a more "enlightened" version of the current industrial society or the neoliberal global civilization, but without its great social or ecological problems. In other words, a form of New Age utopia.

10. Steve McIntosh says - and this is the opinion of most integral theorists - that "integral consciousness" or a "higher level of civilization" depends on healthy market economies with security, mobility and other comforts for the well-off members of the middle class (McIntosh 2007). However, today, only 1 or 2 years later, the market economies are in serious trouble with no prospect of being resolved. Integral theorists can only hope that this is a temporary crisis, but this is not a realistic position. We will know the truth very soon.

11. For example, a leading integrative thinker says that the main problem is not resource depletion or overpopulation, but "lack of mutual understanding in the noosphere[m]" (Wilber 2000:285). In other words, everything depends on human decisions, there are no objective ecological limits (geology, climate, etc.) to human activities. This is an extreme form of humanistic voluntarism and a typical idealization of today's liberal democracy. Integral theorists think that the relative prosperity and tranquility in these societies are the product of "inner moral/spiritual/intellectual development." However, these are much more the product of short-term favorable material conditions. When there is abundant and cheap energy, ethnically, racially, and religiously diverse populations can live in harmony with one another, and governments can be relatively tolerant. But when energy and goods become scarce and expensive, ethnic tensions flare, crime and violence increase, and governments become authoritarian. We have seen all of these trends in recent years in the United States, Britain, and other "advanced" countries (particularly in increasing restrictions on civil liberties), and we will see them much more in the years to come. The "inner development" of an "enlightened" citizenry will not be of much help when industrial societies begin to lose prerequisites that are crucial for normal functioning. Ironically, much violence can especially be expected in the homeland of most integral thinkers, the US - due to its very heterogeneous population and rapidly declining high standard of living.

12. Many thinkers -Mumford, P. Ehrlich, Hardin, Heilbroner, Taylor, Ophuls, Bookchin, Shepard, S. Diamond, etc.- already spoke of the instability and unsustainability of industrial societies in the 1960s and 1970s and William Catton was the first to explain, in a book, what is the Achilles heel of industrial society: its unsustainable dependence on fossil fuels (Catton 1980). So it is no great achievement today to talk in the abstract about the "fragility" and "vulnerability" of market economies. Today we can observe concrete processes of disintegration of industrial civilization and this must be explained.

13. Many thinkers (especially Heidegger and J. Ellul) have criticized the thesis of the neutrality of technology, but for reasons that are not correct (they did not know anything about the theory of biosocial discontinuity). If technology is neutral, so must society, and then every society is equally good: there can be no anthropic problems at all. However, for the biosocial discontinuity theory only one society is natural and only a very simple technology, typical of the hunter-gatherer society, is optimal for the human animal. Complex industrial technology is an integral part of industrial society and inevitably aggravates anthropic problems. No matter how "enlightened" or "moral" people are, they will not be able to adapt successfully to "advanced" technology since their psychology and physiology are characteristic of quite different social and ecological conditions.

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THE TRAPS OF WILBERIAN ECOLOGY: A critical review of Integral Ecology[a,b]

By Tomislav Markus

I. CONTENT AND METHODOLOGY OF INTEGRAL ECOLOGY.

Integral Ecology is based on an unjustifiable optimism and gives hopes that cannot materialize.

Integral ecology is an emerging field that applies Ken Wilber's Integral Theory[c] to environmental studies and research. The field has been explored, in recent years, by the integral theorist Sean Esbj m-Hargens and the environmental philosopher Michael Zimmerman.¹ The authors maintain that the book *Integral Ecology* (IE) tries to integrate more than 80 schools of ecology and 70 schools of environmental thought. It tries to integrate these approaches by recognizing that environmental issues are the result of an observer using a particular method of observation to observe relevant aspects of nature. This post-metaphysical formula, in the opinion of the authors themselves, is summarized as Who (the observer) x How (the method of observation) x What (what is observed).

According to the authors' approach, *Integral Ecology* uses a framework composed of eight ecological worldviews (for example, the eco-manager, the eco-holist, the eco-radical, or the eco-wise), eight ecological modes of inquiry (eg, phenomenology, ethnomethodology, empiricism, or systems theory) and four domains (eg, experience, behaviors, cultures, and systems). The authors start from Wilber's TCTN (all quadrants, all levels)[d] model, with its four fundamental domains or dimensions: SELF[e] (subjective, intentionality, individual experience), IT[f] (objective, behavior), WE[g] (intersubjective, culture/ideas/worldviews) and YOURS[h] (interobjective, social and ecological systems). The authors affirm that an integral approach means that all four spheres have to be taken into account at the same time, and not only the two objective

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

spheres as modern science and many critics of modernity have done (from the romantics to the radical ecologists). . However, *Integral Ecology* places special emphasis on the subjective and intersubjective dimensions, including in some form of nature mysticism. In the authors' view, integral ecology is a consequence of the all-too-frequent demand that the inner human dimensions - personal experience and culture - be given the recognition they deserve. For the authors,

“Integral Ecology is the study of the subjective and objective aspects of organisms in relation to their intersubjective and interobjective environments at all levels of depth and complexity” (IE, 168-9, 173, 478).

The authors state that integral ecology is constituted by methods of studying the subjective and objective parts of organisms that are in relation to the intersubjective and interobjective parts of their environments. This means that, for the authors, integral ecology does not seek a new definition of ecology, but tries to find an integral interpretation of the common definition of ecology. In this ecology, organisms and their environments have “interiority”. The authors ensure that integral ecology also analyzes the “stages of development” in nature and human beings. This includes analyzing how people with different worldviews understand nature. According to the authors, integral ecology tries to unite valid interpretations from many different perspectives into a theoretical framework that can also have practical meaning. According to the authors, the basic framework of integral ecology is based on the integral theory and the TCTN model of Ken Wilber. “*Integral Ecology* is the result of many years of research exploring the many different ecological perspectives and their main methodologies.” The authors state that many different worldviews must be represented, from the natural and social sciences, to philosophy, through religion, cultural norms and values, etc. This is, the authors believe, crucial if we want to develop adequate solutions to environmental problems. In the authors' opinion, this is not relativism, as some perspectives make more sense and are better than others.

The authors state that “Integral Ecology avoids 'gross reductionism' (the reduction of all reality to objective phenomena) and 'subtle reductionism' (the reduction of all interiors to interobjective phenomena)” and organizes all perspectives into a all consistent. For the authors, “the subjective and intersubjective dimensions must be interpreted in their own terms” and not reduced to (inter) objective phenomena (IE 6, 479). Dozens of applications and examples of this framework, currently in real-life use, are examined in the book, including three in-depth case studies by three different authors: work with Hawaiian marine fisheries (by Brian Tissot) , ecoactivists' strategies to protect the Great Bear Rainforest in Canada (by Darcy Riddell), and a study of community development in El Salvador (by Gail Hochachka).

Following Ken Wilber, the authors differentiate between the “bottom-up tradition” (mainly the Axial religions), which devalued the natural and social world in favor of some transcendental reality, and the “bottom-up tradition” of the modern era, which admits only the material world as reality. The descendants deny the possibility of Ascent, except as an eternal and horizontal technological and economic progress and

affirm only two objective spheres (IT and HIS). That was the cause of the dignity (the distinction between art, morality and science and material progress) and the disaster (the exploitation and destruction of nature and indigenous nations) of modernity. The dominance of the descending tradition also meant the rejection of spirituality and inner perspective, and thus the creation of a sense of meaninglessness and absurdity.

The authors criticize radical ecologists (environmentalists), especially deep ecologists, for their “retro-romanticism”, their “regressism”[i], their idealization of “tribal/indigenous societies”, their denial of the “dignity of modernity”, its possible totalitarian tendencies (ecofascism or primacy of the whole over individual organisms), etc. In general, this is a repetition of the critique of Michael Zimmerman - a former Heideggerian deep ecologist - from the 90s of the 20th century and the first decade of the 21st century. Even reformist environmentalists are trapped in the industrial web of “flatland”[j] as they admit that matter and energy are the only realities. The authors think that instead of longing for a “return to nature” or “oneness with nature” (this implies social and personal regression), human beings have to move towards the Spirit or towards higher levels of moral development. and spiritual.

For the authors, integral ecology is, in a certain way, close to postmodernism since it emphasizes the importance of different perspectives, although it rejects postmodern extreme relativism, anti-progressivism and anti-modernism. The authors argue that the perspectivism of integral ecology means that all life has some form of perspective or ability to notice or apprehend things. The authors think that this interiority is developed to the maximum in human beings thanks to abstract thought, self-awareness and language and that in this sense biological evolution is progressive[k]. For the authors, human beings are not only organic beings, but also noospheric[981]².

***II. PROBLEMS OF WILBERIAN ECOLOGY: CRITICAL COMMENTS ABOUT INTEGRAL ECOLOGY.

It is a great irony that this so-called “evolutionary” approach systematically eschews evolutionary biology and contemporary neo-Darwinian theories.

In a previous article, [<http://www.naturalezaindomita.com/dos-caminos-divergentes>][“Two paths divergent”] (Markus 2009b) I pointed out that the “integral theory” should be called, more appropriately, Wilberian theory. The same thing happens with “integral ecology”, whose proper name should be “Wilberian ecology” or even “orthodox Wilberism”. The authors quote entire fragments of Wilber’s works in detail, without any critical analysis. This method is reminiscent of orthodox Marxists and their way of dealing with Marx/Engels theory. The limitations of Wilberian theory are also the limitations of this book.

Every human being and every scientist/philosopher has to have some particular perspective, and this is not a bad thing. However, the moral obligation of scientists

² In reference to the “noosphere” (from *noos*, intelligence or mind in Greek). Certain Noveoera “thinkers” use this term to refer to the group formed by intelligent beings or their minds; It would be something similar to the biosphere, but taking into account only those beings that are intelligent. *N. from t.*

requires that this perspective be questioned as much as possible (in principle, in this way presuppositions stop being prejudices and become testable hypotheses, and later well-argued theories) and that opposing perspectives should be mentioned and their rejection explained. This means that the authors do not present a truly "comprehensive" approach - perhaps because that is impossible? - but start with certain particular fundamental positions. These positions - taken from Wilber, of course - are:

1. Idealism and subjectivism (understood as the primacy of the "inner dimension", of worldviews, ideas and culture, not as the denial of the existence of the real world).

2. Cosmic progressivism (all fundamental changes, from the Big Bang to modern civilization, are part of an "evolutionary advance").

3. Problem-solution ("integral ecology" is presented as the "solution" to ecological problems).

Each and every one of these three positions are taken for granted and have the status of prejudices, not scientific hypotheses. This is inevitable, since the whole project of "integral ecology" - at least according to the perspective of the authors - arises as a form of protest against scientific naturalism and materialist methodology. The idealist approach presupposes a radical dualism between the subjective and the objective, or between the interior and the exterior, just like the traditional mind/body or soul/matter dualism. Scientific naturalism, however many its flaws may be, is monistic and does not suffer from these problems.

What does subjective analysis of ideas/worldviews/values mean? If the "interior dimensions" are not conditioned by the material conditions (biological, ecological and historical-social) of human life, what conditions them then? Do they originate from some kind of "spiritual intuition" or from some internal dimension within the human mind? If they are the product of the inner dimensions, then they can be explained objectively. If the inner dimensions cannot be reduced to an objective dimension, how are they created? This reduction is possible and justifiable exactly because the inner dimension (the self, experience, values, ideas, etc.) is created through objective processes (Darwinian evolution and historical-social changes).

The subjectivist and idealistic approach of the authors leads to mysticism and irrationalism, ironically in the name of "progress" and the "dignity of modernity". At best, this is a very interesting, thought-provoking, and study-stimulating species of speculative philosophy, but it is certainly not some "integral theory" that can "include" science, much less "transcend" it. . Certainly, naturalistic and materialistic science has many limitations, but it is the best we have, because scientific objectivity is rooted in the cognitive structures of the brain, which is the product of eons of biological evolution (on this see: Markus 2009b). . Speculative philosophy - which implies a full return to traditional metaphysics - cannot be a substitute for empirical science. Naturalistic science has, if only that, a rational and much more convincing explanation of the so-called "inner dimensions" of the human mind as products of natural selection and long-term Darwinian evolutionary processes. This is exactly the methodology of Darwinian ethologists, including Mark Bekoff who, ironically, wrote a foreword praising

this book highly. The belief in the autonomy of the "inner dimension" leads either to irrational mysticism or to rational metaphysics (inconsistent with the Wilberian post-metaphysical approach).

The progressive approach is also a major flaw of *Integral Ecology*. On previous occasions I have pointed out that anthropic problems, understood as the main characteristic of all civilizations, are the fundamental stumbling block for all progressive interpretations of recent human history (Markus 2009a, 2009b). My general objections expressed in "Two Divergent Paths" (Markus 2009b) can be applied to integral ecology as well. The authors reject a regressive interpretation of recent human history but without any detailed and substantial analysis. His brief mention of Paul Shepard's theory is especially disappointing (IE 288-291). They do not even acknowledge the theory of biosocial discontinuity, a crux of Shepard's ecological theory, and they place the Catholic theologian Thomas Berry, a quite different thinker, alongside Shepard.

The authors think that since all living things alter their environments (which is, of course, true), all human handiwork and artifacts are "natural" (IE 567). Not much less. From a Darwinian perspective, "natural" is only what has been evolutionarily tested, tested by natural selection over eons of evolutionary time. For example, a beaver's dam is "natural", not because it is part of nature (everything would be "natural" in this sense and this expression would be nothing more than a pleonasm) but because it is an evolutionarily proven artifact that has its roots in the genetic inheritance of the beaver; an anthill is in the same way natural; etc. However, a human-built dam or city is certainly not natural in the sense that it is not rooted in our evolutionary past or part of our genetic heritage. This is the reason why the beaver dam or the anthill are not problematic (neither ecologically nor for the well-being of the beavers or the ants, quite the opposite) unlike dams or cities built by human beings. . Industrial technology is unnatural, not because it is technology - technology also exists in hunter-gatherer societies - but because it is part of industrial society, the most unnatural social order (that is, with the greatest adaptive gap) in all of history. . Acknowledgment of biosocial discontinuity theory -perhaps through a better understanding of Shepard's theory- might have been helpful in this case.

The authors mention several environmental history books, but there is very little historical analysis in their book. They basically believe that the modern worldview ("flatland", "industrial ontology" or scientific materialism) is the main culprit of ecological problems. However, what about the many ecological and other anthropic problems, including the sense of absurdity, in agricultural societies? Surely there was no industrial ontology, "flatland," no modern science - no industrialism, no machine technology, in fact - in such societies. This is why a scientific (and not speculative; as Wilberian approaches often are) historical perspective is so important. I have already written about these problems in "Two Diverging Paths" (Markus 2009b). The authors basically ignore hunter-gatherer societies, in which there was no top-down/bottom-up tradition and no special privilege for humans. They use imprecise and scientifically useless terms, such

as “indigenous” or “tribal” societies, an equally frequent flaw in the Wilberian literature (Markus 2009b).

[m] “Unnatural” in the original. The English term “unnatural” can be translated either merely as “unnatural” or “non-natural” or else as “unnatural” or “contrary to nature”. The second meaning is usually the most frequent. In this text it has also been translated in the latter way. *N. from t.*

Thus, their critique of these societies is of a very poor quality and they make very selective use of the academic literature, that is, they mention only those authors who have a similar position to their own (for example, Edgerton 1992, Keeley 1996, LeBlanc 2003), but not others (for example, Fry 2006, 2007, Ferguson 2006); or they put different authors in the same bag, even those who defend interpretations quite opposed to their own (for example, C. Ponting and D. Hughes who think that the true root of the ecological crisis is the domestication of the Neolithic, the which, however, the authors mention as a ratification of their own position). They think that archaeology, environmental history, and other historical sciences have done much to dismantle the “native understanding” of “indigenous” societies (IE 548). However, as I explained at the time (Markus 2009b), there is no such consensus and many scientists defend a position quite contrary to that of the authors.

For the authors, personal and social regression is the worst of the sins of radical ecologists, especially those who proclaim a “return to the Pleistocene” (IE 32-33). However, as Paul Shepard has pointed out in detail, this can be explained in an entirely different way, as a protest against an unnatural social order (civilization in general and megacities in particular) and as an affirmation of the natural ecological context of humans: a clean, organic, wild environment (Shepard 1996, 1998a, 1998b, 1998c, 1999). Advocating for a clean environment (clean water, air, food, etc.) is not a “regression” at all! On the contrary, a clean environment was the ancient ecological context in which our ancestors lived for millions of years and which civilized (and especially urban) human beings try to recover. If human beings have a genetic need for a clean environment, then they also need a wild, organic environment, since this is also our ecological context. And therein lies the crux of the matter, since when does said effort cease to be “correct” and become “regressive”? Or perhaps such attempts are symptoms of a “higher state of consciousness” to begin with? If this is so, then “primitive” peoples have no need for a clean, organic, wild environment - or perhaps they do, but are not “rationally aware” of it, or... This is hugely confusing to the mind. civilized: the fundamental needs of our nature - indicative of our genetic adaptation to the hunter-gatherer life - cannot be completely ignored, but progressive ideology and the apology of (modern) civilization interpret them as “regression”, that is, as “atavistic” remnants of our remote past, which must be “overcome”. All human behavior is, in a certain sense, “regressive” and “atavistic” since basically it is reduced to the satisfaction of fundamental (genetic) needs or, when this is not possible (because human beings live in an unnatural social environment), to find substitutes for them. These substitutes may be the accumulation of political or economic power over other people or over

nature, consumerism, or the creation of some kind of collective illusion, such as transcendental (celestial) beings, "historical progress," or anything else. I wrote about this in detail in a previous article: [<http://www.naturalezaindomita.com/textos/critica-de-la-civilizacion-y-del-sistema-tecnologico-industrial/los-limites-de-la-iluminacion-spiritual>][*"The limits of spiritual enlightenment"*] (Markus 2009a).

According to the authors, ecological values depend on a "higher moral development" or "ecological awareness". However, hunter-gatherers lack "ecological awareness" (at least in the contemporary sense of the expression) and are supposedly at the lowest level of "development" (both spiritual and material), but still get the best ecological result - from a clean and wild environment to long-term sustainability - in the ranking of all human societies. And, just the other way around: the industrial society -with the "highest level of development" and the greatest "ecological awareness"- obtains the worst result at an ecological level. How is this possible? Although for the authors this must constitute a great mystery, it certainly is not for those of us who accept the theory of biosocial discontinuity. The authors admit this (IE 649-654) but state that this is so due to material factors (small population, simple technology, etc.). Well, it certainly is, but this is precisely a materialist perspective, not an "integral" (read: "Wilberian") way of thinking. After all, what is the main thing when it comes to avoiding ecological and anthropic problems: a "higher consciousness" and a superior "moral development" or adequate material factors, that is, the natural, social and ecological context and the possibility of expressing an evolutionarily proven behavior? Integral theory says the former, biosocial discontinuity theory says the latter.

Professor Esbjorn-Hargens and Professor Zimmerman believe that the Darwinian approach must be avoided in the case of human behavior if we can maintain certain moral constraints on population expansion (IE 13). However, this interpretation is an example of the popular notion of Darwinism[n], namely a dark view of nature as a bloody battlefield or a "tooth and claw nature" due to the maximization of reproductive success. I already wrote about this error, which originates from Darwin's misapplication of the Malthusian hypothesis, in a previous article: "Two Diverging Paths" (Markus 2009b). The authors mention the new Darwinian theories - in which the theory of biosocial discontinuity is very frequently present - only twice and marginally. For example, sociobiology is cited as an example that ecological problems are rooted in human nature (IE 294), although many sociobiologists, including E. Wilson, point to the adaptive gap as the culprit, as does Shepard. There are also some other strange claims about neo-Darwinism in the book, for example, that biosemiotics is a "powerful critique of neo-Darwinism" (IE 570-1), which will surely be completely new to neo-Darwinists (myself included).

Ignorance about (neo)Darwinian theories also fits into the tendency of authors to consider that modern science reduces everything to physics (the fallacy of physicalism). Physics cannot tell us anything about the "mind" or the "inner dimension", but Darwinism and evolutionary biology are something else. The so-called "interiority" (or "spirituality") is nothing more than our genetic inheritance and our evolutionary past,

or what is popularly known as “human nature”, the genetic traits produced by evolution, including our fundamental needs. Living beings, unlike inorganic matter and energy, show an evolutionary inheritance and genetic adaptation to certain local habitats. This is something quite different from physicalism (both mechanistic and quantum).

It is a great irony that this so-called “evolutionary” approach eschews contemporary evolutionary biology and neo-Darwinian theories. The anti-naturalistic and idealistic approach of *Integral Ecology* creates many difficulties, for example: where do ecological values come from? *Integral Ecology* holds that ecological values come from inner development - moral and spiritual. But what about other beings? This means that, for example, the need for a clean and healthy environment for human beings is

[n] “Pop-darwinism” in the original. *N. t.* rooted in “inner development” and for other beings in their evolutionary past. This is a strange and very unconvincing position. In fact, a natural and healthy environment for humans is exactly the same for humans as it is for any other species: an environment of evolutionary adaptation. The idealistic and subjectivist approach is especially evident in the constructivist position. For the authors, there is no human nature based on biology, only a self-constructed “I” and an “inner experience”. This is an extreme version of subjectivist and idealistic constructivism. The authors defend a popular notion of evolutionism[o], an unscientific interpretation of evolution as a creative and “progressive” process, encompassing almost everything from the Big Bang to social macrodynamics. I have already criticized this perspective in “Two Divergent Paths” (Markus 2009b).

Methodological pluralism, with its more than 200 perspectives, seems to be a great strength of *Integral Ecology*. However, a closer look reveals that it is not, since the authors only take into account those specific aspects of other perspectives that may fit their own perspective. Some perspectives - such as biosocial discontinuity theory, which the authors do not even mention - are not compatible with integral ecology even in a very narrow sense. *Integral Ecology* presents a very specific perspective regarding several fundamental aspects:

1. Subjectivism, idealism and humanist voluntarism.
2. Progressivism, especially as regards recent human history.
3. Problem-solution (integral ecology as the “solution” to ecological and other problems).
4. The probability of a sustainable industrial society.

Each and every one of these four assumptions (and probably a few others as well) must be accepted for *Integral Ecology* to make any sense.

Of course, the authors are well aware that contemporary industrial societies may not be sustainable, but *Integral Ecology* would only make sense if they were (since “world-centric” and “planetocentric” values[p] would only be possible in a global industrial civilization). The authors completely ignore fundamental events and processes of our time (such as peak oil or the end of the fossil fuel era). Only once do they mention peak oil (IE 331), but not in the context of a serious theoretical analysis of contemporary societies, but in the fictional case of a certain “Mary Joe” who believes that technology

and the free market can be the solution to various problems, including the “peak oil crisis”. This is an incredible trivialization of probably the most important problem of industrial civilization today. They do not even mention a book or an article -and the bibliography on this is enormous- about peak oil in their bibliographical references (except for the interesting, although obsolete book by W. Catton, *Overshoot*) and just a *web* page (dieoff.org[q]) in a footnote (IE 545).

Integral Ecology is based on an unjustifiable optimism -consequence of the subjectivist and idealistic approach that grants fundamental importance to

[or] “Pop-evolutionism” in the original. *N. from t.*

[p] “Worldcentric and planetcentric” in the original. *N. of t.*

[q] Page currently missing. *N. of t.*

“inner dimensions” as the “key to our future as a species” (IE 478), a very Californian interpretation, and offers hope that may not materialize. Contrary to the authors’ claims, their basic position is not exactly new: the “solution” is moral/spiritual “development” and intellectual “enlightenment”[r] as means for the “good” use of “progress” technological or economic, or “progress” in the “inner dimensions” as a good basis for “progress” in the “outer dimensions” (ecological modernization, sustainable development, etc.). We must be spiritually “enlightened”[983] to use modern technology “wisely”.

It is therefore not surprising that the authors mention “the great advances in alternative energies” (IE 655) nor that they are certainly defenders of “alternatives” and “renewables”. However, that will not work and I have already explained why in [http://www.naturalezaindomita.com/el-ocaso-del-mundo-integral][“El”][http://www.naturalezaindomita.com /the-twilight-of-the-integral-world][twilight-of-the-integral-world”] (Markus 2009c). For example, the authors claim that the percentage of poor people continues to decline to levels never before recorded (IE 153) - and this was written in the summer of 2008 (the date their manuscript was completed), when the mega-crisis had already exploded. and the world financial system was on the verge of collapse. If our problems have roots thousands of years old (as the theory of biosocial discontinuity affirms) and if industrial civilization is not sustainable, there can be no “solution”, neither technocratic nor idealistic; certainly not for the current mega-crisis, nor for the perfect storm (peak oil + climate change + the multitude of other “less important” problems).

Ecological and other miseries are not “problems” at all. They are human-created conditions that humans cannot “solve.” It cannot be solved in the short term because those “problems were created over several millennia” and in the long term (a “solution” to be developed during, say, the next 500 years?); it cannot be solved because this is not a human perspective at all. This is not fatalism (there are many things that can be done, both individually and collectively), but a realistic appraisal of the human condition. I have already written about the problems of Wilberian thought in “Twilight of the Integral World” (Markus 2009c). There are other difficulties and problems in the book (for example, the question of ecofascism, the concept of a “post-natural world”,

[another example of constructivist idealism], biosemiotics, complete ignorance about the greatest tragedy of our time: the population explosion, worldcentrism as a “fundamental characteristic of modernity”, a crude understanding of modern nationalism, the vague concept of the “pneumosphere”, etc.), but I cannot write about all of them here in detail.

There are some good things about this book, lots of thought-provoking claims, lots of information, different perspectives, an innovative interdisciplinary approach, interesting case studies, etc. It is certainly worth reading carefully and more than once, as Professors Esbjorn-Hargens and Zimmerman are serious ecological thinkers in their own right. Some superficiality was probably unavoidable due to the scope of the subject matter. However, in general, there is a substantial gap between what the authors claim to achieve and their actual achievements. It is commendable how far the authors have distanced themselves from anthropocentrism and the illusion of human exceptionalism, which are the main characteristics of the perennial tradition[t]. It is probably too much to ask that they abandon the Wilberian perspective altogether.

In recent years Wilber has stopped responding to his critics (in fact, he hasn’t responded to some well-argued criticisms, such as the article “Wilber and the Misunderstanding of Evolution” [Lane 1996], for a long time), because, he believes, who constantly misunderstand his position (yet another similarity between orthodox Marxism and orthodox Wilberism: the critics always distort the Master’s ideas). It seems that at the Integral Institute only internal (?) criticism is allowed and that all external criticism is seen as a “misunderstanding”. I am hopeful that the authors will take a more constructive and non-dogmatic approach going forward, as they explicitly ask other thinkers to discuss the limitations and problems of integral ecology in particular and integral theory in general (IE 552). This review is an attempt in this direction. Its length is evidence of my conviction that your book, despite its many problems and omissions, is a well-written, thoughtful, and inspiring work. After reading your book, I feel that I am better informed and educated. And at times, the authors have pushed me to think more deeply about my convictions and claims. I am grateful to them for it.

NOTE

1. Sean Esbjorn-Hargens and Michael Zimmerman, *Integral Ecology: Uniting Multiple Perspectives on the Natural World*, 2009, Boston: Integral Books. Quotation marks denote literally quoted phrases or fragments of phrases from the book *Integral Ecology*. I mention my other previously published works on the Integral World *website* page to shorten this review (for example, instead of explaining certain concepts -such as biosocial discontinuity theory or peak oil- I mention my articles most relevant to these topics).

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[<http://www.integralworld.net/markus1.html>][(<http://www.integralworld.net/markus1.html>)].^[u]
- [t] The perennial philosophy is a set of metaphysical ideas that develops from the sixteenth century and that defends the existence of a universal set of truths and values common to all peoples and cultures, which underlies all religions and, in particular, behind the mystical currents within them. *N. from t.*
- 2009b. "Two Roads Diverging"
[<http://www.integralworld.net/markus2.html>][(<http://www.integralworld.net/markus2.html>)].^{[985][986][987][988][989]}
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³ There is a Spanish translation: *Ken Wilber, or the passion of thought*, Kairós, Barcelona, 2004. *N. from t.*

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Introducing the review of Martha F. Lee's book *Earth First!: Environmental Apocalypse*.

Beyond the mere (largely accurate) review of Martha Lee's book, Sessions's review can serve as a general introduction to the story of *Earth First!* in particular and of US environmentalism in general.¹ This is a little-known topic among Spaniards attracted by ecological questions. However, knowing a little about this history can be important for those who intend to effectively combat industrial society based on ecological arguments, since it helps to clarify many aspects that otherwise the mere personal inclination to value Nature as something important and the mere personal logical development of such a tendency they cannot easily anticipate or explain. Feeling that Wild Nature is the most important thing is fundamental and can be enough to start developing a theory or even a current or a movement, but knowing that others have already done it, in a similar way in many respects, can serve to learn from their mistakes and their successes without having to repeat their experience (or at least to complement their own experience with it) and to avoid dangerous naivety without the need to receive lessons.

In this text, Sessions completes and corrects in his own way the already interesting chronicle and analysis by Martha Lee. Many of the details of this story are debatable. For example, if *Earth First!* from the beginning she carried within herself the germ of her own corruption (Roselle was one of the five founders of *Earth First!*; Foreman always showed an excessively open, pluralistic, tolerant and sometimes even sympathetic attitude towards certain issues related to social justice ; *Earth First!* publicly gave maximum importance to ecosabotage from the beginning, with the danger that this entails of attracting undesirables; etc.), or to what extent Sessions' perspective is biased (he is close to the excessively moderate and conciliatory position of Arne Naess) but fundamentally, the point is clear: both Martha Lee's book and Sessions' review show how a movement can go awry and become completely ineffective if it doesn't

¹ The fact that this text refers to the US environmental movement should not make anyone believe that it lacks interest for Spanish readers. Not only because the international environmental movement is largely descended from the American environmental movement, but because many of the important aspects of its development are also present in one way or another in the environmental movements of many other countries. Not only do they cook beans everywhere, but often the beans they cook are the same or very similar.

take care to stay true to its original goal and doesn't keep enough distance. with respect to other movements whose aims are essentially different from theirs. Although in Sessions's review this conclusion is clouded by the obscure phrase: "movements and organizations can, and should, have multiple goals as, if engaged in too many issues at once, movements can exceed their capacity and dissolve their effectiveness, or one major goal (social justice) may come to dominate and overshadow another major goal (protection of ecological integrity)." On the one hand, it says that a movement must have several goals and, on the other, that dedicating itself to too many things can reduce its effectiveness by exceeding its capacity and interfering with other goals. In fact, since having multiple goals encourages ineffectiveness and interference between goals, a movement that wants to be effective must have *one* single main goal. EarthFirst! it was ruined precisely because it had not been able to remain exclusively faithful to its first main goal: the defense of wild ecosystems, and to the basic principle that inspired it: ecocentrism, because it had allowed people with other values and main goals, such as social justice, invade and take over the reins of this movement, blurring its principles, its objectives and its effectiveness.

Book Review by Martha Lee, *EARTH First!* : Environmental Apocalypse.²

By George Sessions³.

Martha Lee's book is the first in a new "Religion and Politics" book series produced by Syracuse University Press. This series focuses on contemporary religious movements and their involvement in politics, analyzing them primarily on the basis of whether they are fundamentalist or liberal, apocalyptic or millenarian. Lee is a political scientist and the author of *The Nation of Islam: An American Millenarian Movement*.

Comparing his new book to Susan Zakin's *Coyotes and Town Dogs: Earth First! and the Environmental Movement* (Viking Press, 1993), Lee asserts that Zakin's book lacks objectivity: it is journalistic, unsystematic, and anecdotal, Zakin sympathizes with the movement, and is a friend of Dave Foreman⁴. Furthermore, it does not focus on Deep

² Translation by Último Reducto of the review by George sessions that appeared in *The Trumpeter* (1996, vol.13, n° 4) of the book by Martha F. Lee *Earth First!: Environmental Apocalypse* (New York: Syracuse University Press, 1995. 208 pages). © 1999 Trumpeter. *Note of*

³ George Sessions is the editor of *Deep Ecology for the 21st Century* (Shambhala Publications, Boston, 1995). He has written three articles on the relationship of ecology to the social justice movement, which have appeared in the 1995 and 1996 issues of *The Trumpeter*.

⁴ Dave Foreman was one of the founders and leaders of Earth First!. *Translator's note*.

Ecology, which is, according to Lee, the basic philosophy of the Earth First movement!⁵ (pages 12-14). Lee's book makes an important contribution as it is undoubtedly more objective than Zakin's in its systematic presentation of the facts surrounding the development and activities of Earth First!. Furthermore, it is based on interviews and a careful analysis, first, of the informal bulletin and, later, of the newspaper *Earth First! Journal* since the beginning of the movement in the early 1980s.

However, the fact of analyzing Earth First! mainly through political criteria and as an essentially religious/political phenomenon, coupled with the conceptual political framework with which Lee usually interprets Earth First! (millennialism and apocalypticism), make all their academic objectivity questionable. For example, he says that "our relationship with this planet is critical to our political identity" and that "for the „Earth First!ers'⁵, the ultimate political meaning is found in wild ecosystems⁶⁷ " (page ix) - these kinds of statements push the usefulness of categories and political analyzes past the breaking point, when trying to assess and discuss basic philosophical ideas and concepts from a political perspective. Moreover, like most modern political scientists, Lee implicitly assumes an anthropocentric bias that suggests he doesn't really understand what ecocentrism is all about. He says, for example, that "The well-being of this planet is what ultimately sustains human life; threats to the health of the earth are threats to human life itself. It is the power of this connection that motivates environmentalism" (page xi). This biases the author against Foreman's ecocentric faction, and in favor of the Roselle/Bari⁸ faction, which pushed Earth First! in the direction of social justice in the late 1980s.

Lee's use of the categories "millennialism" and "apocalypticism" to describe Earth First! (and its two warring factions) throughout the text is clumsy and forced to irritating extremes. Although these interpretive categories occasionally provide interesting insights, more often they cause strange distortions (to fit the facts into these categories), inconsistencies, and gross oversimplifications. The author goes so far as to say that "in all its forms, environmentalism is - at least marginally - apocalyptic" (page ix). Lee also states that "both the apocalyptic and the millenarian [Earth First!] belief systems developed out of the fertile substratum of deep ecology" (page 19). It would not hurt if Lee had supported this assertion in a little more detail.

⁵ Earth First! (EF!) is a radical environmental organization present mainly in several Anglophone countries. *N. from t.*

⁶ Name that the members of Earth First! used to call themselves. Also "EF!ers". *N. from t.*

⁷ "Wilderness" in the original. In this text, "wilderness" has always been translated, unless otherwise indicated, as "wild areas" or "wild ecosystems" *N. from t.*

⁸ Mike Roselle was one of the founders of Earth First!. Judi Bari was a leader of Earth First! in California in the late 1980s and early 1990s. Both (and much of the rest of Earth First!) had strong leftist tendencies and were very interested in social justice, which they considered as important a goal as the conservation of wild ecosystems. Or probably more. Foreman, for his part, (along with some other "Earth First!ers") argued that the primary goal of Earth First! it had to be the defense of wild ecosystems (in fact that was really the original goal; "Earth First!" means "Earth First!") and considered social justice secondary. In the end, the Roselle/Bari faction prevailed and Foreman left Earth First!

Martha Lee explains that the political scientists who developed these categories consider apocalyptic religious movements (here she puts Earth First! in the same boat as fundamentalist groups like Islam) to be inherently pathological to varying degrees (page 23). Since the analyzes of the ecological crisis made by the Foreman faction in Earth First!, as described by Lee (pages 41-42 and 59), essentially coincided with the analyzes recently carried out by the National Academies of Sciences of many countries throughout the world and by the 1992 Warning to Humanity from the World's Scientists, perhaps some future book in Syracuse University Press's "Religion and Politics" series will document the apocalyptic nature (and thus, pathology) of the professional scientific organizations of the world.

Lee claims that Deep Ecology has been the philosophy of Earth First!, although he admits that most EF!ers read very little about the philosophy of Deep Ecology and that explicit mentions of Deep Ecology did not appear in the book. *EF! Journal* until mid-1984 (pages 18, 37 and 57). It's quite painful to have to read some of the positions taken by the Foreman faction in the *EF! Journal*: For example, Foreman stating that even nuclear war would not be very harmful to Earth and would hasten the end of industrial society, his comments saying that "wild ecosystems are the real world" (he is all real!-what happens is that the rest have to be restored and recolonized) and that we should "let the Ethiopians starve"; Christopher Manes suggesting that one of the solutions to overpopulation would be to dismantle life-saving medical technology and that AIDS was Nature's solution to overpopulation; and Reed Noss talking about the "deep ecology genetic elite" as the "chosen people" to save the Earth (pages 64, 68, 83-84, 9293 and 101-103). [Paul Shepard and EO Wilson have claimed that all humans have the "wildness gene"⁹ but that it is inhibited, especially in modern urban people]. Given that many, but not all, of these articles appeared under various pseudonyms, one can speculate as to whether Foreman, Manes, and the others were merely exercising as individuals their right to free expression of radical and shocking (and perhaps misanthropic) ideas. ; if those ideas really expressed the philosophy of Earth First!; and/or if they thought that the ideas they were expounding were the natural result of the philosophy of Deep Ecology. If the latter, they were profoundly mistaken in their understanding of the philosophy of Deep Ecology as expounded by Naess and other theorists of the Deep Ecology movement.

Lee rightly points out that the ideas of Edward Abbey¹⁰, expressed primarily through his novels (and his association with Earth First!), "had inspired the formation of the movement" (p. 126). Since "from the beginning of Earth First!, Dave Foreman served as prophet and leader" (page 105) and because of Foreman's idolization of Abbey, the prevailing philosophy and ideology of Earth First! during the 1980s are probably best described not so much as Deep Ecology, but more as an idiosyncratic

⁹ "Wilderness gene" in the original. *N. from t.*

¹⁰ Edward Abbey, American writer whose radical ecocentric and pro-ecosabotage ideas greatly influenced the discourse and practice of Earth First!. *N. from t.*

and somewhat misanthropic Abbey/Foreman version of ecocentrism coupled with an image of eco-saboteurs “Southerns, rednecks, and conservatives defending wild ecosystems”¹¹ which some people found offensive.

The Foreman/Earth First phenomenon! is not understood through contorted and forced comparisons with apocalyptic fundamentalist groups (such as certain versions of Islam) but rather through the role played in the uninterrupted history of the development of the American environmental movement throughout the period comprised by the last decades of the 19th century. and the entire 20th century. This is perhaps best described in Stephen Fox’s book *John Muir and his Legacy: The American Conservation Movement* (Little, Brown, 1981). Fox’s key conceptual tool for describing the dynamics of this drama is the “radical amateur tradition” that he says has been “the driving force of conservation history.” In stark contrast to bureaucratic environmental professionals and government agencies, “radical amateurs,” Fox asserts, “provided quality, independence, and integrity,” served as “the conscience of the movement,” and revitalized the movement again and again, while helping to keep your priorities pure and present” (page 333).

Viewed from the perspective of Fox’s analysis, there is a striking continuity in the “radical amateur” conservationist tradition stretching, in its main phase, from John Muir¹² to Dave Foreman¹³ via Dave Brower¹⁴.¹⁵ Muir was the great ecocentric pantheistic prophet of the 19th century who preached the protection of the wild world and the ecological integrity of the Earth. After Muir’s death, the Sierra Club¹⁶ essentially regressed back to the level of a low profile, elitist, anthropocentric mountaineering club dedicated to protecting wilderness for its aesthetic and recreational value. In the 1950s, however, Dave Brower (called by Fox “the reincarnation of Muir”) and other energetic young leaders of the Sierra Club resurrected the spirit of Muir’s crusade, ecocentric underpinnings, and goals of curbing limitless population growth and economic development and to protect wild ecosystems and ecological integrity. Following

¹¹ “Rednecks for wilderness” in the original. The term “redneck” in the United States has a double meaning. On the one hand it means “ignorant peasant” from the southern states of the United States and, on the other, “reactionary” (probably because in the United States a large part of the southern rural population has traditionally been characterized by showing conservative political and social tendencies). The expression “rednecks for wilderness” plays with this double meaning. *N. from t.*

¹² John Muir (1838-1914), Scottish-born naturalist who spent most of his life in the United States; He was the founder of the Sierra Club and an early advocate for wilderness conservation. *N. from t.*

¹³ Dave Brower, American environmentalist, executive director of the Sierra Club from 1952 to 1969, and founder of the environmental organizations Friends of the Earth and the Earth Island Institute, among others. *N. from t.*

¹⁴ Dave Brower, American environmentalist, executive director of the Sierra Club from 1952 to 1969, and founder of the environmental organizations Friends of the Earth and the Earth Island Institute, among others. *N. from t.*

¹⁵ Dave Brower, American environmentalist, executive director of the Sierra Club from 1952 to 1969, and founder of the environmental organizations Friends of the Earth and the Earth Island Institute, among others. *N. from t.*

¹⁶ The Sierra Club is a leading US environmental organization. *N. from t.*

Brower's removal as executive director of the Club in 1969, and after the 1970 Earth Day hoopla had passed, environmental professionals took control of the major [American] environmental organizations (including the Sierra Club) developing the same bureaucracies and tactics as the government's professionalized environmental bureaucratic apparatus. This new post-Earth Day environmentalist apparatus was powerful and financially rich, but throughout the 1970s and 1980s it became increasingly anthropocentric, pragmatic, focused on urban pollution problems, interested in politics and negotiator in his philosophy, tactics and objectives. In reaction to concessions made by conservationists regarding wilderness protection¹⁷, Dave Foreman and Earth First! re-assumed the role of Brower's "radical amateur" to reassert, in new, dramatic and controversial ways, the ecocentric understanding of environmentalism of Muir, Leopold¹⁸ and Brower, once again reinvigorating a demoralized environmental movement during the anti-ecological Reagan era¹⁹, reprioritizing population stabilization and protecting wilderness and ecological integrity, and calling for an end to political concessions made by professionals in the environment. (Overall, Zakin's book illustrates this continuity better than Lee's, the latter tending to treat Earth First! almost as if it were an isolated phenomenon.)

Back in 1990, Earth First! suffered a major upheaval, as Martha Lee points out, with the resignation of Dave Foreman (he was under investigation by the FBI at the time) and the takeover of the organization by the Roselle/Bari faction (with its "Emphasis on Social Justice"). As Lee comments, "Therefore, the social justice faction thus established itself as the new Earth First!" (page 145). Lee cautiously seems to support this change as a more humane expression of the movement that resulted in a new and better Earth First!. The unspoken assumption you seem to be making here is: if a movement is not explicitly concerned with social justice issues, then it is misanthropic. But such an assumption is obviously fallacious. To be sure, there were excesses on the part of the Foreman faction, but movements and organizations can, and should, have multiple goals, for if they pursue too many issues at once, movements can go too far and dissolve their effectiveness. , or one major goal (social justice) may come to dominate and overshadow another major goal (protection of ecological integrity).²⁰ Earth First!'s original purposes and goals They were explicitly defined from the start, and Foreman repeated them over and over in the *EF! Journal*. Kris Sommerville of Foreman's faction saw the split between the two factions as a "basic philosophical

¹⁷ "The wild" in the original. *N. from t.*

¹⁸ Aldo Leopold, an American forester, created the so-called "Earth ethic". *N. from t.*

¹⁹ Ronald Reagan, Republican (Conservative) President of the United States from 1981 to 1987. *N. from t.*

²⁰ "...but movements and organizations can, and should have, differing goals and, by spreading themselves too thin, movements can overextend themselves and dilute their effectiveness, or one main goal (social justice) can come to dominate and overshadow another main goal (the protection of ecological integrity)", in the original. The Spanish translation offered here is basically literal, despite the fact that the inconsistency and lack of clarity of this piece suggest that perhaps there was an editing error that changed the meaning of the original text when it was published in *The Trumpeter*. *N. from t.*

disagreement within the Earth First! (biocentrism, that is, wild ecosystems vs. anthropocentrism, that is, social justice)" (page 140). Foreman stated: "I see that what is happening now in the Earth First! it is the same thing that happened to the Greens in West Germany - a premeditated attempt to transform an environmentalist group into a leftist group" (Dave Foreman, "Whither Earth First!?" in, Foreman, *Confessions of an Ecowarrior*, Harmony Books, 1991, pages 213-220).

Muir, Brower, and Foreman's insights about making wilderness protection the highest ecological priority (in the sense of protecting the ecological integrity of Earth and species habitats and trying to save what's left of the world wild calling for cessation of growth and development) have now been confirmed by leading ecologists and conservation biologists around the world. For example, Anne and Paul Ehrlich recently noted that "the devastation of biodiversity...is the single most serious environmental danger facing civilization" (Anne and Paul Ehrlich, *Healing the Planet: Strategies for Resolving the Environmental Crisis*, Addison Wesley, 1991, pages 35-37). Martha Lee describes how, after her departure, Foreman created, with John Davis, the newspaper *Wild Earth* and how (in line with the original goals of Earth First! -and, in this sense, of the goals of the Sierra Club of Muir/Brower-) has collaborated with conservation biologists to develop the Wildlands Project²¹ and the North American Wilderness Recovery Project²² (pages 143 and 145-146). Perhaps, at this critical time for ecosystems, the winds of change are blowing again - it is no coincidence that Anne Ehrlich, Brower and Foreman have recently been elected to the Sierra Club National Board of Directors and that this organization has just decided call for a ban on all logging of primary forest in National Forests²³ and have appointed a 23-year-old who idolizes Brower as president.

The rift between Foreman's ecological faction and Roselle's social justice faction that tore Earth First! it is part of the larger conflict between anthropocentrism and ecocentrism that has existed throughout the history of American environmentalism. During the 1960s, as Stephen Fox has pointed out, "new human-centered leaders" emerged from the environmental ranks, such as the socialist biologist Barry Commoner or Ralph Nader²⁴, who saw pollution industry as the essence of the environmental problem and disdained the protection of wildlife and wild ecosystems. Before Earth Day was celebrated in 1970, the environmental movement had already split into an anthropocentric branch concerned with urban pollution and led by Commoner, Nader and Murray

²¹ The Wildlands Project is an American environmental organization now called the Wildlands Network. Its objective is to provide strategic and scientific support to the creation of a wide network of wild ecosystems connected by ecological corridors. *N. from t.*

²² The author is likely referring to North American Wilderness Recovery Inc., a member organization of the Wildlands Project. *N. from t.*

²³ "National Forests" in the original. National Forests are certain areas of the United States, comprising large wooded and forested areas that are owned by the federal government and managed by the United States Forest Service. *N. from t.*

²⁴ Ralph Nader, American lawyer and politician, candidate for the presidency of the United States for the Green Party in 1996 and 2000. *N. from t.*

Bookchin²⁵, and an ecocentric branch concerned primarily for human overpopulation and for the protection of wilderness and the ecological integrity of the Earth, centered around Brower, Paul Ehrlich, and most professional ecologists (see *John Muir and His Legacy*, chapter 9).

The innovative ingredient in this mixture has been the explicit addition of struggles regarding social justice to the field of urban pollution, especially during the last decade, promoted by eco-Marxists, eco-socialists, postmodern deconstructivists and other elements with a leftist political base. For example, reinterpretations and new versions of the history of the environmental movement have been put forward by Robert Gottlieb (*Forcing the Spring: The Transformation of the American Environmental Movement*, Island Press, 1993) and Mark Dowie

(*Losing Ground: American Environmentalism at the Close of the Twentieth Century*, MIT Press, 1995). Gottlieb and Dowie usefully criticize the professionalization and compromise of the main environmental organizations (the Group of 10²⁶) throughout the 1970s and 1980s, but also propose that environmentalism should shift its priorities from protecting biodiversity and the ecological integrity of the Earth to an agenda focused on urban pollution and social justice (now called the “environmental justice” movement). Dowie applauds the “shift in emphasis from the natural to the urban domain [that] has transformed American environmentalism... The central concern of the new movement is human health. Its members consider the preservation of wilderness areas a value worthy of respect but overvalued” (pages 126-127). Dowie considers Gottlieb’s book, *Forcing the Spring*, to be a “watershed in the revisionist history of environmentalism” that captures and supports this shift toward issues of urban pollution and social justice (page twenty-one). Dowie proposes that people of color, exemplified by the 1991 People of Color Environmental Leadership Summit (whose primary concerns at this point have been equity issues in establishing toxic waste sites) in urban areas), they should be the leaders of what he calls the new environmentalism of the “fourth wave” (pages 151-155 and 251-263).

To lend further support to (and to ignite feelings of outrage for) his “environmental justice” stance, Dowie reinterprets conservation history by showing it through the lens of class, ethnic, anthropocentric social analysis, and gender. He asserts that the conservation movement has historically been a “special interest” lobby: a racist “white man’s club” dedicated to “protecting their sources of aesthetic pleasure...” (pp. 2-3 and 30). Similarly, Gottlieb offers a stereotypical account of the Sierra Club’s conservation struggles in Brower’s day, during the 1950s and 1960s, portraying them as attempts

²⁵ Murray Bookchin, American theoretician, staunch enemy of Deep Ecology and founder of the eco-left current called “Social Ecology”.

²⁶ The group of the largest and most influential environmental organizations in the United States is called the “Group of 10”: Defenders of Wildlife, Environmental Defense Fund, National Audubon Society, National Wildlife Federation, Natural Resources Defense Council, Friends of the Earth, Izaak Walton League, Sierra Club, The Wilderness Society, and the World Wild Fund for Nature. *N. from t.*

to protect wilderness for its value as aesthetic and recreational resources for an elite minority (pages 41-46).

The charges of racism and elitism leveled against the traditional American conservation movement throughout its history have some validity, but for the most part only with respect to a few groups of early 20th century hunters and ornithologists (see Fox, pages 345-351); fundamentally, they do not apply to the ecocentric motivations of Muir, Leopold, and their disciples, nor to Brower's Sierra Club. These accusations, made by Dowie and a few others, tend to serve as a "bait": they divert attention from real ecological issues and the gravity of the contemporary global ecological crisis.

A key document (often ignored by environmental historians) that makes clear the basic irrelevance of accusations of racism and elitism - by telling the story of a radical move towards ecocentrism in the Sierra Club in protecting wilderness, the passage from a recreational and aesthetic anthropocentric posture to an ecological attitude- is the book by Michael P. Cohen, *The History of the Sierra Club 1892-1970* (Sierra Club Books, 1988). As Cohen points out, Brower says he changed his philosophical outlook from a recreational to an ecological stance in protecting wild ecosystems after veteran Sierra Club leader Harold Bradley sent him a copy of the book in 1950. Leopold's book, *Sand County Almanac* (pages 116-117).

The Sierra Club's Wilderness Conferences²⁷ began in 1949 and soon led to discussions of wilderness philosophy²⁸, with Sierra Club leaders Brower and Richard Leonard, the Service biologist of Parks, Lowell Sumner, and the president of the Wilderness Society, Howard Zahniser, on the side of biocentrism (or ecocentrism); in doing so, they believed they were following the philosophies of Muir and Leopold. At the 1957 conference, Sumner and the biologist A. Starker Leopold advocated basing the protection of wild ecosystems on ecological grounds. Brower published the proceedings of this conference in the 1957 Sierra Club Annual Newsletter attempting to use, Cohen suggests, these ecological arguments to influence Club policy (pages 124-133 and 214-217). (Throughout the 1950s and 1960s, in their popular writings and arguments, the Club, like Muir had done, still made mostly aesthetic/recreational arguments in advocating wilderness to appeal to anthropocentric audiences.) For similar reasons, the Wilderness Act²⁹ of 1964 was drafted by Zahniser as an anthropocentric document, even though Zahniser was ecocentric). At the 1959 conference, biologists Raymond Cowles and Leopold Starker linked threats to wilderness with the problem of human overpopulation (again on ecological grounds); the Club adopted a population policy in 1965 (pages 232-233, 369, 414 and 436-437). Brower wrote the foreword to Paul Ehrlich's book, *The Population Bomb*, in 1968 (page 414).

²⁷ Lectures on Wild Ecosystems. *N. from t.*

²⁸ "Wilderness" in the original. In this case I have thought it more appropriate to translate it as "wild nature". *N. from t.*

²⁹ The Wilderness Act, authored by Howard Zahniser of the Wilderness Society and signed into law by President Lyndon D. Johnson, created the legal definition of "wilderness." in the United States and involved the protection of 36,000 km[2] of federal lands. *N. from t.*

Although the popular consensus among environmental historians places the beginnings of modern environmentalism in 1962, with the publication of Rachel Carson's book, *Silent Spring*³⁰; Carson's book is important primarily for dramatically focusing public attention on environmental issues. Michael McCloskey (Brower's successor as CEO of the Club in 1969) points out, correctly in my opinion, that the wilderness movement of the 1950s marks the beginning of the modern environmental movement. The environmentalism of the Ecological Revolution after the Second World War, and the clarification of its ecocentric philosophy, according to

McCloskey, began with the Sierra Club Wilderness Conferences of the mid-1950s, and continued with the Sierra Club activist crusade in the 1950s and 1960s under the leadership of Brower (Cohen, pp. 133-134).

To achieve an effective reconciliation between ecological concern and concern for social justice (referred to by J. Baird Callicott³¹ as the "Marx means Muir" issue), Arne Naess mentions the "three great popular movements" (the environmental movement, the social justice movement, and the peace movement) that, in the latter half of the 20th century, have come together to form the international Green movement for social change. Naess argues, however, that identifying the The Green movement (and the other movements that make it up) confuses the environmental movement. The Deep Ecology Movement strongly supports sustainability for all societies, but sustainability in the "broad" ecological sense of protecting "the whole of the richness and diversity of life forms on the planet." Naess agrees that societies will not achieve full sustainability until significant advances are made in the achievement of all the goals of the Green movement, although in any case, a very high priority must be given to ecological issues. Although Naess and other environmentalists and supporters of the Deep Ecology Movement are very concerned about issues of peace and social justice, Naess nonetheless asserts that "considering the accelerating pace of ecological destruction through On a global level, I find it acceptable to continue to strive for ecological sustainability whatever the state of affairs concerning the other two goals of Green societies." Proponents of the Deep Ecology Movement, Naess argues, "should be concentrating on concrete issues related to the ecological crisis (including its social and political consequences)" (for more on Naess's comments, see George Sessions (ed. .), *Deep Ecology for the 21st Century*, pages 267, 413-414 and 445-453).

Based on Naess's analysis of the relationship between the environmental and social justice movements, it is obvious that Foreman's faction of Earth First! was on the right track, and that there was no point in expanding and changing the goals of the organization to include issues of social justice. Organizations that have historically been specifically dedicated to environmental issues, such as the Sierra Club, should maintain those goals. As for those who propose that the environmental movement

³⁰ There is a Spanish translation: *Silent Spring*, Crítica, 2005. *N. from t.*

³¹ J. Baird Callicott, American philosopher specializing in environmental philosophy and environmental ethics. *N. from t.*

should shift its priorities from ecological issues to issues of urban pollution and social justice ("environmental justice"), it behooves them to show that the global ecological crisis is much less serious than what that scientific organizations around the world are affirming. But, from what we have seen, this may be asking too much.

Presentation of "The limits of spiritual enlightenment", "Two divergent paths" and "The decline of the Integral World"

We came into contact with the texts of Tomislav Markus (1969-2010) through "Welcome to the Pleistocene, your home"[a] and from there we became interested in his ideas, fundamentally in what he called biosocial discontinuity theory (of very briefly, the incompatibility between human nature and civilized ways of life). After reading some of his texts available in English, we were surprised by the existence of many common points between some of his ideas and those raised by Wild Nature.

Among these common points are the defense of a scientific and materialist way of understanding reality, the defense of the existence of human nature and the understanding of the profound incompatibility between it and civilized societies. In addition, Markus more or less rightly criticizes those ideas that defend that humans are always superior beings and completely alien to the rest of nature and independent of it and that ideals, values and beliefs are what determine the characteristics of societies. or human behavior. This author also defends a radically anti-progressive position that is very worthy of being taken into account.

Another aspect to highlight is that Markus, historian, researcher at the Croatian Institute of History[b], was honest and courageous enough to capture the ultimate logical conclusions of the development of his ideas: that civilized societies are, due to their intrinsic characteristics, the cause of many of the problems we face today (and in the past). What the author calls "anthropic problems" (the social and ecological problems caused by the very structure and activity of human societies). It may seem somewhat insignificant, but today, unfortunately, there are many scientists and intellectuals who do not dare to openly express all the logical conclusions derived from their studies.

Focusing on the texts that follow, despite being focused on the criticism of the theories of the "guru" Ken Wilber[c] and his followers (actually a pseudo-rational branch of the New Age), we believe that intelligent readers will be capable of drawing general conclusions applicable to many other current ideologies and currents of thought, and for this reason we publish them.

the relatively modern idea of the presumed absolute evil of these social traits and simply denies their existence in those societies that he intends to offer as a reference: the hunter-gatherers.

There would also be much more to say about demographic and technological expansion, Markus, in the following texts, denies that they have their basis in our evolutionary past, but does not explain where they are. How did they start and why? Where did they come from?

Another problem is that, in these texts, the lack of freedom is not mentioned at any time. Markus states that the basic human needs are: "community, belonging to a place, clean and wild environment, social and ecological stability, equality, peace, etc." and that its absence is the cause of "anthropic problems" and the search for "loopholes" or "compensation". It may be that freedom, understood as the autonomous development of our natural tendencies and capacities, was not a basic human need for Markus, although it may also be included within "etc.". If he does not mention it because for him it was not one of the basic human needs, he is wrong. If, on the other hand, it were contained in the "etc.", it would not have been out of place for the author to at least mention it, since the denial of freedom is one of the fundamental causes of the current "anthropic problems", probably much more important than the absence of peace or equality.

Similarly, Markus here tends to fall into the tired and false debate between what we might call "bad' Nature" *versus* "good' Nature" (or Hobbes/Malthus vs. Rousseau; competition vs. cooperation, etc), leaning towards the second position.

In reality, this dichotomy is a simplicity, beginning, as has already been said, with the stupid assumption that certain things, such as competition or cooperation, violence or peace, inequality and equality, etc., are always bad. or good by themselves, and following because they are not always mutually incompatible traits. Thus, to mention just one example regarding competition and cooperation, very often, many living beings (or groups of living beings) are more efficient when it comes to competing against other living beings (or groups of living beings).) precisely because they cooperate with each other. In such cases, would we be talking about cooperation, competition, or both at the same time?

Another typical problem of the author in these articles is his peculiar notion of the concept of "morality". According to him, biosocial discontinuity theory in particular and modern biology in general tell us what is wrong with the way of life of civilized human beings, and suggest that the proper way of life is one to which we are adapted. : the hunter-gatherer way of life, but at the same time he denies that this is moral. If talking about what is wrong or what is wrong is not moral, then what is? In addition, there would be much to discuss about the normative nature of biology (fallacy of naturalism). Basically: it is impossible to logically infer value judgments *merely* from empirical facts. As much as Markus tries and it annoys those of us who largely share his ideas and value judgments, the fact is that establishing what is right or wrong or what should or should not be done is not the task of science. biological. When science

apparently dictates value judgments, duties and goals, it is because it has ceased to be just science. And this is a problem since it disguises as science what is not to justify it fraudulently (thus hiding ideological, subjective biases, etc.).

Another philosophical problem with Markus in these texts is his monism (or rejection of dualism) regarding the relationship between the human and the natural. This relationship is a much more complex and nuanced phenomenon than is usually suggested by the mere reduction of it to the typical debate between two opposing positions: the dualist (or exceptionalist) that affirms that the human *never* is part of Nature, and the monist that affirms that what is human is *always* natural. In fact, the author himself, like many other monist assumptions, in practice ends up differentiating between the natural and the human or artificial (or even the unnatural) despite everything.

Another problem: while the author's negative view of humanism and progressivism is quite correct, he often errs in these articles by being overly optimistic, in the sense that he seems to believe that both the natural sciences and even most the social sciences and humanities have already abandoned these positions, when the reality is very different. In fact, the cases of experts in the humanities and social sciences who are certainly critical of humanism and progressivism, such as the author, are really rare today. Moreover, even a large part of Natural scientists (physicists, chemists, biologists, geologists, etc.) actually assume humanist and progressive positions, not only on a personal level, but also even in their scientific work.

Finally, a regrettable error that could easily have been avoided: the author seems to have believed too much in the calculations and predictions of the believers in peak oil, which has caused him to fail miserably in many of the concrete forecasts he makes in your texts. While it is true that the energy crisis is a real threat to the techno-industrial system and that it is very likely (although not certain) that it will end up collapsing spontaneously in some way, venturing to give exact data, not just about the quantities of fossil fuels available (or from other possible sources of energy), but even about when certain events will occur (crashes, crises, spikes, etc.), assumes a high probability of risking screwing up and being silly. And the worst thing is that the failed forecasts of people like the author discredit his theory in general in the eyes of the public, even though it is mostly correct and very worthy of being taken into account. Trying to accurately predict the unpredictable often fails.[d]

In this sense, it should be noted that the author's idea of building a new and correct society is also naiveté doomed to failure. For precisely the same reason: social systems in particular and reality in general are largely unpredictable, and therefore impossible to control and manage based on prior planning. A social system can be successfully destroyed, but it cannot be successfully built by following prearranged plans.

Despite all of the above, these articles provide an interesting critique of the idealism present both in political ideologies (for example, anarchism, liberalism, socialism/communism) and in supernatural or religious beliefs (such as New Age, Christianity or the Islam).

[d] See about peak oil: Review of *The Party is over*, in Naturaleza Indómita: [\[http://www.naturalezaindomita.com/resenas/the-party-is-over\]](http://www.naturalezaindomita.com/resenas/the-party-is-over)[\[http://www.naturalezaindomita.com/resenas/the-party-is-over.\]](http://www.naturalezaindomita.com/resenas/the-party-is-over)

GUNS REVIEW GERMS AND STEEL, BY JARED DIAMOND.

By Gerardo Sanz.

Just 700 years ago much of the planet was still populated by hunter-gatherers. However, in the last 600 years there have been a series of clashes between developed Eurasian societies[*] and less developed societies in other parts of the world. We all know the outcome of those clashes and their most immediate consequence: today the entire planet is divided into industrialized states, except for Antarctica for reasons so far obvious, leaving hunter-gatherers only in unproductive regions such as deserts and arid regions or well in remote and hitherto inaccessible regions, such as tropical rainforests.

Jared Diamond, (training biologist), tries to analyze in a scientific and rational way the reason for this outcome. The immediate cause is obvious since, at the time of the crash, Eurasia had denser, organized and technologically superior populations, in addition these Eurasian populations were carriers of epidemic diseases (such as smallpox or measles) to which they had developed a certain genetic resistance. . The best known example of this phenomenon, but by no means the only one, is the discovery of America and the conquest of the West.

However, the big question that the author tries to answer in this book is: what were the ultimate factors that led to this asymmetry? Or put another way: why in recent times were certain Eurasian societies the ones that possessed this series of advantages and not, for example, the Indians of North America or the Australian aborigines? Why was it not sub-Saharan Africa? the one who discovered and conquered the New World? Perhaps the answer lies in cultural reasons and it turns out that the redskins (to give an example) were "pure in spirit" and the Europeans unscrupulous greedy and had developed these advantages for a purely cultural reason?

To find the answer, Jared Diamond takes a journey through the different paths that humanity followed from the appearance of *Homo Sapiens* until the clashes between Eurasia and less developed peoples, passing through similar clashes that occurred during the prehistory of the different continents among peoples with different degrees of development; subsequently, it analyzes the outcome of these shocks and their current consequences. The beginning of these advantages undoubtedly begins with the appearance of agriculture and livestock and with the improvement of the "packages" of crops and domestic animals, this led to a logical sequence of events that led to the appearance of dense populations, diseases epidemic and centralized states possessing writing

and technology. A scientific and multidisciplinary study shows that only in some parts of the planet could this sequence be developed "quickly" and effectively, in others its development was tremendously slow, resulting in very backward stages in recent times and in most of the planet never happened. In addition, the author shows how, since the Neolithic, the peoples who developed these advantages displaced, annihilated or imposed themselves on their neighbors, the conquest of America being simply one more event of this type, although very well documented and known because it is recent times. This is illustrated in detail with examples such as the Austro-Indonesian expansion in Southeast Asia or the Bantu expansion in Sub-Saharan Africa; These expansions did not always take place in such a surprisingly rapid and spectacular way as the conquest of the New World, but the ultimate (and often immediate) factors that explain them have always been the same to a greater or lesser extent.

As an example, I will mention that even with current genetic technology, many of the "promising" crops or animals that were not domesticated in the past have not been domesticated. Such is the case, for example, of holm oaks or zebras. Other animals or crops domesticated in historical times, both by genetic engineering and traditional methods, have so far turned out to be largely irrelevant as they neither pull plows nor serve as mounts nor do they produce a significant proportion of the staple diet.

The conclusions reached by the book are emphatic, the chain of events that have led to the current techno-industrial system have their origin and basis in material factors and not in conscious decisions derived from cultural trends. These material factors are the broad pattern of history that has led to the current techno-industrial system. Although it is true, as Diamond also analyzes, that cultural factors have had relevance at the local level, they have not altered the current outcome of events in a relevant way, since these have shown to be tremendously changeable even at the local level; cultural factors may explain, for example, why Australia is of mostly English rather than Chinese descent or why America was not discovered by a Chinese, but they are unable to explain the broad pattern of history.

Knowing the answer, or at least the best possible approximation, to the question posed by Diamond is essential for the development of a solid and rational ideology that seeks to put an end to the techno-industrial system; Likewise, it is advisable to know it so as not to fall into the typical leftist myths regarding culture, human behavior and the development of utopian and politically correct societies, such as the myth of the "noble savage".

A good understanding of this leads us to the conclusion that if the last consequence of the chain of events, which Diamond tries to analyze in his book, has been the current techno-industrial system and this chain of causality being the consequence of purely material factors, a The effective movement that seeks to put an end to it must identify its material pillars as objectives and not focus on changing its ideology. Although it is true that these material pillars are not entirely clear and delicate work is needed to identify them without contradicting our main values; For example, it is obvious that

ending "everything" would end the techno-industrial system, but it would also end wild nature, which is one of our main values.

I will also point out that despite the relative complexity of the book, the author writes it in a very understandable and entertaining way. Also, given the academic popularity enjoyed by the author, it is a widely distributed and easy-to-find book.

** In this book the author adds North Africa to Eurasia since, due to geographical and climatic barriers, it is more related to traditional Eurasia than to the rest of Africa.*

BEHAVIORAL ADAPTATION: understanding the human animal [1, 2]

(Book by Manuel Soler)

The author of this book (a biologist by profession) explains in it, in simple language, how and why the bases of human behavior have their origin in evolution by natural selection (Darwinism) and are hereditary. This is not a political essay or a writing about environmental movements and wild ecosystems, common themes on this page, but simply a popular science book. But this time it is a subject rarely recognized within environmental movements: wild human nature. I emphasize this because for many nature lovers it seems as if it were limited to non-human animals, plants, rivers, plains and mountains,... that is, to ecosystems; while humans remain aside, as beings from another planet. It is true that today, almost the entire human population lives within fundamentally artificial environments (cities and towns), but the evolutionary environments of all human beings have been until recently (on an evolutionary scale) the wild ecosystems and modes of nomadic hunter-gatherer life, in which the innate qualities of our species were forged. In the same way that the African lion that has been in a zoo for generations is still better adapted for life on the African savannah where it evolved, we humans conserve our nature adapted to life in wild ecosystems. And that, the innate, is also part of wild Nature, for some our fundamental value.

The book begins by explaining why it makes sense to analyze human behavior from an ethological perspective (like that of any other animal) and giving a brief explanation of the scientific method that he will use next. From that moment on, the chapters dedicated to specific aspects of behavior begin. Those treated in greater depth are: search for a partner, reproduction, parental care, group behavior, altruism, relationships between species and animal communication. Most of these aspects of behavior are commonly perceived among humans in a very comforting way: as the result of a premeditated decision, that is, voluntary. If an influence is recognized, it is usually that of the environment (that society has made the individual behave this way and not otherwise). The book shows with multiple examples how the innate (the capacities, tendencies and needs that form human nature) unconsciously influences our behavior, just like it happens to any other animal species.

In this way, the book provides numerous examples of something that surely all the readers of this page have in their minds at least at an intuitive level: that human beings are animals. It may seem to the reader that this is something too elementary and recognized within the techno-industrial society to need to provide evidence about it. But the reality is that, beyond acknowledging, in the abstract (and sometimes not even that), that humans are animals, very few people seem to accept some of the implications that this entails (especially those implications that are incompatible with civilized ways of life). It is unfortunate that, with few exceptions, not even biologists (including the author of this book) are capable of openly acknowledging such implications (such as the one pointed out earlier with the example of the African lion). Time and time again, in their writings or public interventions, most scientists go back and propose some exception for the human being (that if we have already changed something biologically with the centuries or millennia that we have been in civilization, that if we have to have faith that humans will be able to adapt to the world that technological development is creating, that human intelligence allows us to rebel against our instincts, etc.). It seems as if the scientists who study the human being are afraid of ending up disappointing their colleagues in the academic circle or the general public. Recognizing all the implications of being animals seems that, with few exceptions, it is too much to ask for a sector of society (the scientific community) perfectly integrated into modern society. Consequently, most scientists show a notable discrepancy between the knowledge they obtain through their scientific work and the conclusions they ultimately reach influenced by their moral values. It may be important to know how to differentiate both things (the proven fact of moral conviction, which is what some would like it to be...).

The book in particular also contains some other critical and/or erroneous aspects. Next, I am going to address this issue by focusing on a couple of specific aspects of the book that seem to me to be of special relevance to us:

The rebellion against the instincts

One of the main ideas of this book comes to say that what differentiates us humans from other species is not that we have stopped having instincts (as men of letters have traditionally defended) but that our intelligence allows us to rebel against said instincts. instincts. When assessing this, the context in which these apparently contradictory acts with the evolutionary process take place should be taken into account. For example, according to the author, we humans rebel against the evolutionary instinct par excellence (that of reproduction) as the birth rate in developed countries is currently well below the human reproductive potential (page 43 of the book):

“As we have already highlighted, accepting our animal condition does not imply that we are slaves to our genes. In fact, one of the things that makes us different from the rest of the animals (in my opinion the most important) is that we are the only species

that has been capable of rebelling against the evolutionary instinct par excellence, the one that directs the behavior of animals. individuals, in the direction that allows them to leave the maximum possible number of descendants and of the best quality. Today, the birth rate (for example, in Spain it is 1.3 children per couple) is well below the human reproductive potential, which shows that we can face our instincts and master them. Genetic predispositions favor the expression of a specific behavior, but never blocking the mind so that nothing can be done against that innate tendency.”

Soler here seems to have preferred to ignore facts that he knows very well. like: (1) The reproductive instinct (what he calls the “evolutionary instinct par excellence”) is not directly focused on having children. but to have sexual relations (although there may also be an innate drive to start a family). (2) When studying the innate behavior of a species, it is convenient to observe said species in its natural habitat (its evolutionary environment) and not only in artificial environments or in captivity. The behavior in both environments is not always similar. (3) Although in developed countries the birth rate has been relatively low in recent decades. globally the population has continued to grow (the birth rate is much higher in other less developed and more populous countries). In addition, the ecological and social environments always generate certain limits to human activity. It is one thing to want and another to be able.

On the first point, do humans really rebel against their basic reproductive instinct (sex)? It is more than clear that the vast majority of humans have not stopped having sexual relations, only some of its effects are patched, often temporarily, through contraceptives and / or abortions (and despite everything, most people, sooner or later, he continues to mate and/or have children).¹

More flagrant is the omission of the second point by Manuel Soler. If someone wants to argue that human exceptionalism is based on the fact that our intelligence allows us to rebel against our instincts, they should try to provide examples of it based on groups of our species in their natural evolutionary environment: nomadic hunter-gatherer cultures or, at the very least, , some other primitive culture (the behavior of humans in fundamentally artificial environments need not be similar in all respects to their behavior in wild environments). In fact, many wild animal species have problems reproducing in captivity². Others control their number of descendants to a certain extent by limiting the number of embryos or killing the offspring that they think they

¹ Term coined by Lovelock himself to define his work on Gaia theory. The “geo” for the Earth and the “physiologist” because he studied the systems and dynamics of terrestrial functioning in a similar way to how physiologists study the functioning of the bodies of living organisms.

² An example: “You may have noticed that I use the metaphor of ‘The living Earth’ when talking about Gaia, but I don’t mean that I consider the Earth to be consciously alive, nor not even alive in the sense that an animal or a bacterium is. I think it is high time that we broaden the dogmatic and limited definition of life as something that reproduces and corrects the errors of reproduction by natural selection among the progeny.” (*Earth’s Vengeance*, page 38).

will not be able to carry forward³ (does Soler think in this case that these animals are rebelling against their instincts thanks to their intelligence?).

Third, Soler chooses the current Spanish birth rate (1.3 children per couple) as an example. But we Spaniards or, more generally, the inhabitants of developed countries, do not represent more than a minority of the world's human population. Other countries (and not precisely the smallest or the least populated), have a birth rate much higher than that of Spain, and that, taken as a whole, means that, in reality, the birth rate worldwide is not looks a lot like that of Spain: the world population continues to grow, already more than 7,000 billion. Haven't the Ethiopians, the Chinese or the Hindus, for example, evolved enough to rebel against their instincts? Aren't they smart enough? ...something is wrong with Soler's theory.

So whichever way you take it, it doesn't seem like humans are all that exceptional: the human ability to control the birth rate isn't that great, it doesn't always work, and it's not exclusive to humans. Furthermore, it is not even a completely modern phenomenon (it also exists to some degree in primitive cultures⁴).

Wild animals living in captivity may display abnormal behaviors with respect to their species (depending on the extent to which captivity allows them to satisfy and develop their innate needs, tendencies, and abilities). And the human species does not have to be any exception: the techno-industrial society has subjected humans to radically different environments and ways of life from those in which the species had previously evolved, so it would not be strange that some of the behaviors of modern humans are different from those of humans belonging to primitive cultures. Currently, many humans postpone having children indefinitely, following the example of reproduction, in order to dedicate their time to the social concerns that modern industrial society offers them as good and desirable, or that are simply necessary and essential to live within said society. But this may not be normal for our species. In fact, as far as I know, not wanting children has been very rare in humans until very recent times (especially among humans belonging to nomadic hunter-gatherer cultures, which would be the true example).

More importantly, modern industrial civilization may benefit if many people forget about having children and start worrying about things like getting an education, a job, or a better reputation in society. But another thing is that humans, as individuals, benefit from being deprived of satisfying and correctly developing many of the needs, tendencies and capacities with which evolution has endowed them (in the case of the example, those related to reproduction and Raising children).

Surely this is a question of values: what kind of freedom one considers more important. Fortunately or unfortunately, some of us continue to think that true human freedom is not so different from that of other species: it consists in being able to sat-

³ The "Earth sciences" or "geosciences" are the disciplines, within the natural sciences, that study the structure, morphology, evolution and dynamics of planet Earth.

⁴ A couple of examples:

isfy and develop autonomously, or as members of a small group, our needs, tendencies and innate capacities, that is, that is, our nature, and not in having to contravene it to adapt to the requirements of large and complex social systems such as the techno-industrial society.

Natural selection in techno-industrial society

The other point of the book that I am going to comment on is the one that says that evolution by natural selection is not being slowed down or modified by the modern industrial way of life and, especially, by the advances in medicine that have occurred in recent centuries. Soler analyzes and settles this complex issue in a couple of pages in his book, and it is so wide. This is the only thing he says about modern medicine and changes in mortality rates in humans (page 61 of the book):

“...it should be noted that the progress of medicine and the decrease in mortality, although they are two real facts, do not have to prevent the action of natural selection, since it acts mainly on differential reproduction ; that is, if there is a trait that favors a more efficient reproduction of the individuals that carry it and that trait is heritable, it will become more frequent among the population generation after generation.”

He then analyzes a case in which the principles of natural selection seem to hold within modern industrial civilization: the relationship between social status (measured by economic level) and the number of descendants (although he acknowledges that the same relationship does not exist). is fulfilled when taking into account, instead of the economic level, the academic level) (pages 61 and 62). This is the only evidence that Soler provides in his book that evolution by natural selection continues to act within techno-industrial society. And nothing else says on the subject.

Now, what use would it be for an individual to have a trait that, a priori, would favor more efficient reproduction if others who did not have it could raise their offspring in the same way, helped by modern technology? In a scenario where the least efficient traits (or perhaps one should say genes) had the same chance of reproducing as the most efficient ones, how would the latter become more prevalent in the population generation after generation?

In the previous paragraph I have been somewhat exaggerated on purpose: the current situation probably does not reach those extremes. It is true that individuals with more efficient traits can continue to reproduce more, but if other individuals that, previously, did not even reach the age of reproduction, now arrive and can in turn have offspring and carry them forward, natural selection remains, at least braked. For Soler, it seems that demonstrating that natural selection does not completely disappear within techno-industrial society is synonymous with the fact that it is not being disrupted by it at all, when, in reality, they are two very different things. Soler provides arguments and data that, at most, show that evolution by natural selection still con-

tinues to function in a certain way within modern society, but he is not interested in showing how technological development is slowing down or disrupting said evolution.

For example, I have already mentioned something about infant mortality in humans, this has been, until very recently, quite high⁵, while today, in developed countries, this mortality is very close to 0% [8], and this alone makes it possible for a considerable percentage of the population that, until very recent times, did not reach the age of reproduction (nor, therefore, to have offspring), now does. And this alone is already a notable brake on natural selection in humans.

Second example, the elimination of natural selection regarding "mild" visual problems through the use of glasses or contact lenses (modern technology). Today, people with myopia, astigmatism, etc. It does not have any type of disadvantage to survive and reproduce (except for the economic handicap of having to buy glasses or contact lenses), while in primitive societies it would have problems correctly carrying out important activities such as hunting, for example.

Third example: modern medical aids to childbirth. Previously, women with a narrow birth canal or other reproductive complications had little or no chance of giving birth naturally. However, with modern medical methods, many of these women are able to give birth without too much trouble, saving both their lives and the lives of their offspring. In other words, there was a negative selection in the past that prevented these traits (the narrow birth canal or other traits that make natural childbirth difficult) from becoming very common among the female population, somehow maintaining the genetic health of the species. Currently, at least in developed countries, that selection may not be at work, at least to a great extent, since women with traits that make natural childbirth difficult or impossible may, in many cases, have as many or more offspring (and therefore spread these deleterious genes -not very efficient- among the population) than those that do not have them.

Fourth example. Even at the cultural level, the techno-industrial society attacks the principles of evolution by natural selection: many political measures of current social institutions promote the integration of individuals with genetic defects of some kind through some kind of positive discrimination. For example, to access certain jobs, it is necessary to have a certificate that demonstrates a certain degree of physical and/or psychological disability, which facilitates the integration (and therefore increases the chances of forming a family) of individuals with traits that, in principle, did not favor a very efficient reproduction (in cases in which said disability is of genetic origin). In other cases, economic aid or pension is given to those with permanent disabilities that make it impossible for them to work. Or simply to people who, for whatever reason, do not have a job at that time. These cultural practices have not spread now and not before by chance: the industrial means of production allow the possibility of a

⁵ For example: "*We became the infection of the Earth a long and uncertain time ago when we intentionally used fire and tools, but it was not until about two hundred years ago that the long incubation period ended and the infection began. industrial Revolution; then the infection of the Earth became irreversible.*" (*The Earth runs out*, pages 246-247).

significant percentage of the population being inactive or not very productive. The ways in which people with permanent physical and/or psychological disabilities would likely be treated in primitive societies could vary widely (from outright intransigence to condescension and help to the best of their ability) but whatever the case, what is it is clear that their means did not allow them to maintain a large number of unproductive individuals. So there was, at least in uncivilized societies, a negative selection towards these kinds of genetic traits. This has also been held back to some extent by techno-industrial society.

Fifth and last example. Although in the book, Soler speaks exclusively of how current life circumstances (industrial civilization) affect evolution by natural selection in humans, something similar can be said about wildlife in general. The level and intensity that human activities have acquired in recent times threaten what has been until now "the crucible of evolution", which is nothing more than the only or mainly wild environments. As examples of how the techno-industrial society is disrupting this process not only in humans, but for all wild species, we can cite: destruction and fragmentation of habitats, alteration of geological cycles at a planetary level, alteration of the climate at a planetary level, extinction of species, drastic and rapid decline of wild populations for one reason or another, hybridization with domestic individuals, and much more.

In short, I believe that the examples provided in the preceding paragraphs are more than enough to demonstrate that, at the very least, techno-industrial society is slowing down and disrupting evolution by natural selection.

In any case, despite the above flaws, I believe that scientific writings on human biology, such as this book by Manuel Soler, can be valuable material for those of us who believe that Wild Nature is the most important thing and that techno-industrial society should disappear in the sense that knowing the implications of being an animal (speaking clearly), knowing how to explain it and knowing and disentangling the most common arguments against it may perhaps help to defend ourselves publicly against our detractors and to make the appropriate decisions, as well as to better understand the behavior of humans and other species in the techno-industrial society (and therefore, in any other group made up of people).

Grades:

1. Reviewed by AQ
2. Editorial Synthesis, 2009.
3. This paragraph is too short when it comes to trying to explain something so complicated.

" There are individuals who consciously and intentionally adopt and comply with celibacy and chastity and who, at least in this aspect, seem to be capable of 'rebellious against their instinct.' But, first, they are a tiny minority that is not representative

of the general behavior of the human species. And, second, it would be necessary to really see to what extent his rebellion against instinct is real and successful. I mean, many people who embrace celibacy and chastity are probably individuals with especially low intensity sexual urges. The innate needs, tendencies and capacities of our species (our nature) do not manifest to the same degree and manner in all individuals. We are a highly polymorphic species, that is, we are a species that, within common general characteristics shared by all its members, shows great individual diversity in the expression of many of them (usually the distribution of traits is of the type called 'normal' or Gaussian bell in statistics: a large majority displaying the trait with a very similar intensity and mode, and a few minorities displaying it at very high or low intensities and/or in different modes than the majority). In the case at hand, most people feel a moderate need for sex, then there are some people who feel a very strong need for sex and there are others who hardly miss it. A person belonging to this last group will be able to maintain chastity with ease and with hardly any disruption or negative consequences (and will probably even tend to seek it, in certain circumstances). A person with a strong need for sex will not be able to maintain chastity if they decide to adopt it (and probably never even want to try). And a normal person (with a normal need for sex) will have a hard time maintaining chastity in the long term if he adopts it and will suffer certain psychological disorders because of it (this was what happened in Freud's time with Victorian morality). In other words, if someone whose nature makes them show little interest in sex adopts chastity, it is worth asking: 'is he really rebelling against his instinct or rather following it?'. And, if someone with a normal need for sex adopts chastity, one must ask: 'at what price?' If his rebellion against instinct causes him serious psychological disorders, can it really be said that he has successfully rebelled? The disorders are the demonstration that the instinct is still there, very much alive. But even if the instinct could really be suppressed and the rebellion was real and complete, what value is that? Why is something so important? Suicides also successfully rebel against the survival instinct, but how and why does that make them better beings? At a biological level (which is the one that really matters) normally the rebellion against instinct does not bring more reproductive success to those who practice it, rather the opposite (especially in the case of rebellion against sex). Soler, in this rebellion against instinct, argues from a humanist point of view, based on values and concepts of success that are far removed from 'reproductive success'.

- control of the expression of certain instincts occurs in our species, and in others as well. It is a fundamental aspect of what is called intelligence, consciousness, intelligent behavior, etc. The more conscious and intelligent an animal is, the more it self-controls the expression of certain instincts, adapting it to environmental conditions to make it more efficient and advantageous. But it is one thing to have some self-control over behavior and another to be able to completely rebel against instincts. Instincts are always there, pushing and commanding. Self-control has limits and beyond them it ceases to be possible or profitable. For example, there are animals that can avoid eating something that they suspect may be dangerous to them (something poisonous

or the bait of a possible trap, for example), even if they are hungry (that is, even if their instinct pushes them to eat). But if they keep that attitude for a long time and refuse to eat for many days, they starve. And in fact, the hungrier they feel, the harder it is to control the urge to eat. The same goes for the need for sex. The vast majority of people, even if they feel like having sex, do not grab another person of the other sex (or of the same sex if they are homosexual) and try to copulate with her directly and immediately. They maintain control and follow certain guidelines (courtship or flirtation) that many times do not even end with success and that even in the majority of successful cases imply a postponement in the practice of sex (normally the 'here I catch you, here I kill you').

And finally, the reproductive instinct has many aspects in humans. The main and essential is the sexual impulse, but there are also others, related to it but different. In all cultures, most adult human beings, at some point in their lives, feel the desire to form a family (which in turn implies the desire to find a partner and the desire to have children with her), and many of them feel dissatisfied if they don't get it. This is what I think makes it so that even today people often end up marrying and having children. The use of contraception can serve to avoid the consequences of sex without the need to repress this impulse, but in the long run it prevents the need to start a family from being satisfied. That is why, in the end, many end up deciding to have children. In other words, Soler does not give one. He sometimes confuses using contraceptives with actually rebelling against reproductive instinct, when most people's reproductive behavior continues to say otherwise. I think this paragraph should at least explain all of this."

[This note is a personal communication from Último Reducto to the author discussing a draft of this text; published with the permission of Último Reducto].

4. For example, the cheetah and the vicuña are two wild animals that have considerable difficulty reproducing in captivity. Due, among other things, to these difficulties, these animals have never been domesticated; and this despite the interest that its possible domestication has aroused in humans over the last millennia. For more information, see: Jared Diamond, *Guns, Germs and Steel*, Ed. Debolsillo, 2011, page 197.

5. For example, here is a brief description of how clutch size is regulated in some birds of prey based on available resources: Antonio Manzanares, *Field guide to birds of prey in Spain*, Ed. Omega, 1991, page 50, paragraph 3.

6. For example: abortion, infanticide, treatment of women, prolonged lactation, homosexuality, masturbation, *coitus interruptus*, non-coital heterosexual techniques, age and type of marriage,... are indicated as means to influence reproductive rates in primitive or pre-industrial societies in these books:

- Marvin Harris, *Cultural Anthropology*, Ed. Alianza, 1990. Pages 137-142 ("Practices of population regulation").

- Marvin Harris and Eric B. Ross, *Death, Sex and Fertility*, Ed. Alianza, 1991. Chapter 1: "Population regulation among early human foragers".

7. “Annual birth rates between 40 and 45 and mortality rates of more than 38, per 1000 inhabitants in a population, are characteristics of agricultural societies that lack hygiene and medicine. Those rates were typical, during the 17th century[[bookmark569](#)][[I\[a\]](#),] in Western Europe and North America, as well as in the rest of the world.” Paul R. Ehrlich and Anne H. Ehrlich, *The Population Explosion*, Salvat Ed., 1993, page 49.

8. “The industrialization of the West meant an improvement in living conditions, better housing and food, and notable advances in terms of hygiene and health. These changes produced a decrease in the mortality rate, especially among children and infants, of whom many more managed to survive their first years of life.”, and following paragraphs. *Op. cit.*, pages 48 and 49.

[a] Despite the fact that in the original it said “13th century”, I believe that this is a mistake and that the authors were surely referring to the 18th century, for various reasons:

- While there is no particular reason to mention the 13th century, the 18th century was the last century of the pre-industrial era in Europe and North America and during it saw the transition from pre-industrial to industrial society, with the change in the mortality rates that this implied.

- It is unlikely that the authors knew the mortality rates in North America in the thirteenth century, since, unlike in Europe, in pre-Columbian America there were no written records that served as a source of such data. In civilized parts of eighteenth-century America, however, similar records already existed.

- In the book, the following sentence says: “During the nineteenth century, the mortality rate of some nations fell to less than 30 per thousand.” So it seems more logical that they were referring to the 18th century.

In the absence of the sacred. The failure of technology and the survival of Indian nations.

(Book by Jerry Mander).¹

This relatively long book (Olañeta, 1996) could well have been 3 different books, one with a holistic critique of technology, another on the cultural legacy of Indian nations and indigenous societies around the world, and another on the indigenista struggles that have occurred in recent times. If they form a single book, it is mainly due to the political orientation that its author wanted to give it. Jerry Mander finished writing this book in 1991 and we could consider him an alter-globalizing environmentalist with the concerns of that time. That is to say, those of an anti-capitalist eco-leftist whose alternative society was not that of the Soviet Union (which still existed at that time) but that of indigenous societies (or, rather, those of the idealized and politically correct portrait that some anthropologists disseminated). of them).

The first and second parts of the book ("Issues That Should Have Been Asked About Technology" and "The Inevitable Direction of Mega-Tech" respectively) are probably the most interesting despite being peppered here and there with the author's leftist concerns. In Spanish there are very few books in which global criticism of technology is raised and tools for its critical analysis are provided. This is one of them and we must recognize that merit. However, it suffers from some important flaws to consider, not only the leftist values advocated by the author, but also some fairly common topics in environmental leftism. For example, Jerry Mander implies in places that a society can, given the necessary information, make appropriate decisions about every technology that is invented and build a relatively complex technological system through a conscious and rational process. We know that this is impossible because the evolution of complex technology results in a multitude of feedbacks and unforeseen consequences that are beyond the ability of any society to choose. It is an autonomous evolutionary process and one that inevitably harms wild nature. In a way, it is understandable that Mander made this mistake. He knew first-hand some cases in which the introduction of a specific technology, television, was being the subject of discussion among some Eskimo communities in North America. The introduction of television had produced

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

a cultural change that was abrupt and threatened the traditional Eskimo way of life. This had caused neighboring communities where they did not have television to warn of the danger to their cultures and to consider rejecting television. But the case of a particular technology in a society with a small-scale technological level can hardly be applied to the global technological evolution of modern techno-industrial society.

Mander also falls for the anti-capitalist obsession that new technologies like computers favor the power of companies and mega-corporations. Being true, the problem is not capitalism but that complex technology has to be implemented by large organizations whose operating logic has little or nothing to do with that of a small human group. The problem with this is not that companies are dedicated to the search for profit or that they fall into greed but that individuals, small groups and wild nature lose their autonomy in favor of ever larger and more powerful organizations. In other types of economic systems the same thing would happen in essence, simply capitalism until now has been the one that has best interpenetrated with the technological system.

The third and fourth parts ("The suppression of the indigenous alternative" and "World War against the Indians" respectively) come to explain the title and subtitle of the book. Mander argues that the vast majority of indigenous societies have cared for the land on which they lived thanks to a worldview that considered it sacred. It's a highly debatable statement, not because societies didn't really have those beliefs, but because the role it gives them in the relationship *those societies had* with the ecosystems they lived in seems like a gross overestimate.

When we read that Marshal Sahlins and Pierre Clastres are some of the anthropologists on whom Mander bases his knowledge of many of the indigenous societies he mentions in the book, doubts about the claims he makes in these parts grow exponentially. I am not going to say that everything described by Mander about indigenous societies is false, but there are certainly false descriptions and that makes me doubt the veracity of the others. One important thing about the final part of the book is that it stimulates a healthy mistrust of negotiations with the techno-industrial society and, in general, of the agreements and legislation of a civilized society. None of them serve to protect the freedom and autonomy of the wild and, if after reading the review that Mander gives to the relations of civilized societies with indigenous societies of the last 2 centuries, someone were still confident in the possibility of reforming the system to prevent the serious damage caused by modern technology, we would have to qualify him as credulous of the first, probably a careful technophile.

All in all, is Mander's book one worth recommending? With due caution and caveats, probably yes. The criticism he makes of technology is very relevant and both his personal experience (throughout his life he has seen the introduction of most of the technologies with which many of us have already grown up since childhood, he knows the before and after) and that of indigenous communities illustrate an increasingly undeniable reality about the importance of technology. It is a pity that these analyzes

are mixed with indigenism and other forms of leftism, as well as false anthropological information and idealizations of indigenous societies.

AN ETHICS OF THE LAND¹

(Book by Aldo Leopold; edition by Jorge Riechmann)²

This book is a partial edition of the major work of Aldo Leopold (1887-1948), an American forester turned conservationist, *An Almanac of Sandy County*. The original is divided into three parts, of which only the first appears in its entirety in this Spanish edition by the leftist Jorge Riechmann. Of the second part there are only four texts of the fifteen originals and of the third, one of four. The excuse given by the editor for this half-finished job is lack of space. To complete the nonsense, it is included in a collection entitled "Classics of Critical Thought" along with works by Marx, Lenin, Gandhi, Martin Luther King, Kropotkin, etc., with which it shares little or nothing.

Leaving aside the use of this edition for the dissemination of the editor's ecosocialist creed, what remains of this book by Leopold describes in its first part what he experienced and perceived on a farm in a county in the state of Wisconsin (State located north of of the United States along the Great Lakes). In this farm, which Leopold had acquired to put his ideas on ecological restoration into practice, the descriptions of the natural environment are concentrated. As Leopold narrates his experiences as a logger, hunter, and fisherman, he displays all his knowledge of the ecology of Wisconsin's central counties. In addition, it points out the modifications of native ecosystems caused by European colonization. The rapid transformation of nature from a virtually savage state to a civilized industrial one had taken place in barely 150 years when Leopold wrote this book, and there was no sign that it was slowing down.

Leopold was one of those who expressed the need to contain this transformation and, at least, establish certain areas where it should not occur. In the second and third parts, it is where the main arguments in favor of the wild are found and where expressions that today are of reference in Anglo-Saxon conservationism appear, such as "think like a mountain", "a fierce green fire" and "an ethic of the Earth". Leopold expresses himself in a literary and even poetic style in certain parts, but this does not stop him from expressing clearly that wild creatures and wild environments must continue to exist in the world without their existence being supported by an economic interest for humanity. . In fact, its prologue begins like this: "There are people who can live without wild beings, and others cannot. These rehearsals come to be the joys and dilemmas of someone who can't".

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity*.

² Original title: *The Vanishing face of Gaia*.

In some passages of the book, it seems that Leopold thought that progress and wild nature could somehow coexist. Today it is difficult to support that claim with 70 years of trends repeatedly proving otherwise. This book was written in the forties of the 20th century. Wild nature is not the same and neither is what threatens it.

The tools proposed by Leopold to achieve such coexistence are mainly based on education, ethics and State action. Conservationism and environmentalism today follow this line, with very limited results.

Some excerpts from the book can serve to illustrate Aldo Leopold's ideas:

"But current education does not mention obligations to the land, beyond those dictated by selfish self-interest. The result is that we have more education, but less soil, less healthy forests, and as many floods as in 1937." (Page 140)

"A basic weakness of a conservation system based on economic motives is that the majority of the members of the land community do not have an economic value. For example, wild flowers and songbirds. Of Wisconsin's 22,000 higher plants and animals native to Wisconsin, it is doubtful if more than 5 percent can be sold, grazed, eaten, or otherwise used economically. And yet, those creatures are members of the biotic community, and if (as I believe) their stability depends on their integrity, they have a right to continue to live."

When one of those non-economic categories is threatened, if we happen to love it, we invent subterfuges to give it economic importance. At the turn of the century, songbirds were supposed to be disappearing. Ornithologists rushed to their rescue, citing not-so-convincing evidence that insects would eat us alive if the birds stopped controlling them. The tests had to be economic in nature to be valid."

It is embarrassing to read these circumlocutions nowadays. We do not yet have a land ethic, but we have at least come close to admitting that birds should continue to exist by pure biotic right, regardless of the presence or absence of economic advantage to us." (Page 142)

"Perhaps the most serious obstacle impeding the development of a land ethic is the fact that our educational and economic system has turned its back on genuine land consciousness, instead of moving towards it. Modern man is separated from the earth by many intermediaries, and by innumerable gadgets. He does not have a vital relationship with her; it's just a space between cities where the crops grow. Take him out for a day in nature, and unless it's on a golf course or in a "scenic" area, he's bored to death. If crops could be produced hydroponically, instead of on farms, that would be great. Synthetic substitutes for wood, leather, wool, and other natural products of the earth, he prefers to the originals. In short, the earth is something that "has become small"." (Page 154)

"One of the requirements for an ecological understanding of the earth is a knowledge of ecology, and this is by no means equated with 'education'; in fact, most higher education seems deliberately to avoid ecological concepts. An understanding of ecology does not necessarily come from courses that carry the green label; it could equally be

given in geography, botany, agronomy, history or economics courses. So it should be; but, beyond the labels, organic preparation is scarce.

Advocating a land ethic would seem like a lost cause, were it not for the minority who rebel against these "modern" trends.

The pivot that must be moved to set in motion the process of evolution that would lead to a land ethic is simply this: stop thinking that the proper use of land is only an economic problem. Examine each issue in terms of what is ethically and aesthetically correct, as well as what is economically appropriate. Something is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends to something else. It goes without saying that economic viability limits the scope of what can and cannot be done for the land. It has always been so and always will be." (Pages 154 and 155)

From these fragments, it can be concluded that Leopold was not exactly a naive believer in educational benefits. What would be your response today when you see the implementation of environmental education and its results? Environmental education has nothing to do with its land ethic since the former is totally utilitarian and anthropocentric, but the practical consequences of its implementation speak volumes about the possibilities of causing a drastic change in social direction through education. Surely most of those who read this already belong to those generations educated in environmental awareness and the state of nature today is no better. They can also account for the current behavior of their classmates or their own. It is easier for children to provoke a change in behavior than for adults, but it cannot be concluded from this that they are going to bend the forces that operate in society and determine its course. The technological system modifies society so quickly and is accepted so religiously that it continually outperforms the situations in which many of us were educated to behave "ecologically". Progress has such an inertia that no educational system has been able to stop it in the slightest, in any case it has been its spur. If today's more "educated" and prudish generations can despise the latest artificial insemination techniques in pigs and at the same time clap their ears when they see the latest computer gadgets and stand in queues to implant the interfaces or chips that allow them to be more connected, if all this happens, it is not because of pro-technology education or the lack of ecological education. It is because society is being shaped by forces like technology far superior to moral education. Leopold's book can contribute little to the analysis of technological development and how it destroys the wild. However, the fundamentals of his thought, that the wild has value - an irreplaceable value - and that we cannot fully live without the wild world, are a powerful source of inspiration.

With Friends Like These... Last Redoubt vs. Ludd's Friends

(Book of Last Redoubt)¹

A few years ago (2008) this compilation of articles was published by *Último Reducto* in book format. This is an exchange of comments and criticisms that *Último Reducto* and the *Friends of Ludd* collective maintained for years. This last group, after publishing in its newsletter two articles with direct and indirect criticism of *Último Redoubt*, did not agree to publish in its newsletter the responses sent by him, so that *Último Reducto* decided to publish them a few years later, after reviewing them, along with the original articles from The Friends of Ludd and other later reviews.

The debate is tinged by a certain animosity between both sides, which makes it difficult to rationally analyze the issues raised and some of the issues discussed are certainly not very important for the development of an ideology and a movement contrary to the techno-industrial society.

But, despite these drawbacks, the book as a whole provides a very important vision: it serves to make it very clear that the objectives, the ideals and even the strategy and tactics to follow to try to achieve them, are given based on the basic values that are held.

Specifically, not all those who say they reject the techno-industrial society do so from the same basic values nor, therefore, do they have the same goals and ideals. Rejecting techno-industrial society because it destroys or subjugates wild Nature (including human nature) is not at all the same as rejecting it because it threatens the development of "civilization" and the "human spirit" or against "the libertarian ideal." The ideals in either case are very different: A wild world in the first, versus a civilization (not industrial at best) in the second. And so are the goals: the complete destruction of techno-industrial society, regardless of the consequences for civilization or humanity, or worrying about what kind of societies would emerge later (should human beings survive) in the first, versus to the substitution of the techno-industrial society for a new "ideal" society (more "human", more civilized, more democratic, more libertarian, more sustainable...) in the second. And this is something that those of us who have as basic values the autonomy of wild Nature and the rejection of leftism, progressivism

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

and humanism, must be very clear, if we do not want to end up joining the enemy and unconsciously working for him.

The author himself explains it this way in the introduction to the book:

This work is aimed at the public interested in criticizing the techno-industrial society. Its main objective is for readers to be able to appreciate the profound and notorious ideological, psychological and moral differences between at least two of the self-considered currents contrary to techno-industrial society: the one of which Los Amigos de Ludd is a clear exponent and the one exemplified in this article. case by Last Redoubt.

Who wants more information or wants to collaborate in the dissemination of this book can contact *Naturaleza Indómita* or directly with *Último Reducto* ([mailto:ultimo.reducto@hotmail.com][last.reducto@hotmail.com]).

Presentation of THE DISCORDANT HARMONIES REVIEW

Clinging to the fallacious argument that there is no state of balance or order or regularity in Nature, that, in ecosystems, the normal state is disturbance and chaotic change and creating the straw man of the supposed ecological belief in a completely static Nature, some ecologists, such as Daniel Botkin, have tried to justify and promote the complete management and domestication of the Earth. If, after all, according to these authors, the normal state of ecosystems is disturbance and imbalance, it is "natural" for human beings to alter Nature and interfere in its processes. The fallacy of the absence of ecological balance has had quite an impact, especially in certain humanistic environments¹. And, unfortunately, also even among some unsuspecting "defenders of wild Nature" unaware of the real background and the true significance of such arguments.

The following text is a review that deals with this issue, offering several arguments that correctly refute Botkin's exaggerated claims about the supposed lack of balance, order and regularity in Nature.

It is only necessary to add three criticisms of the philosophical position of the author of the review, Stan Rowe, all of them related to his postmodern ideological bias:

First, that in order to demonstrate that Botkin's position is not as objective and free from ideological and cultural influences as he claims, it is not necessary to embrace relativism (or what comes to the same thing, the constructivist thesis of the theoretical load of observation: "the primacy of theory over facts, of paradigm over what seems real", "all facts are loaded by theory - theory leads and facts follow"), just as to show that someone lies or is wrong, there is no need to deny the existence of truth in general. Rather, the opposite is advisable, since if the possibility of achieving a minimum objectivity (independence of cultural, ideological, theoretical or subjective

¹ The ecology of imbalance, disturbance and chaos has been especially attractive to certain philosophers, historians, anthropologists, etc. who have believed they have found in it, among other things, a "scientific" justification for their humanistic defense of the past, present and future cultural transformation of ecosystems by human beings. See, for example, "Conservation and Subsistence in Small-Scale Societies" by Eric Alden Smith and Mark Wishnie, in *Indomitable Nature* (<http://www.naturalezaindomita.com/textos/conservacin-y-subsistence>)[<http://www.naturalezaindomita.com/textos/conservacin-y-subsistence>]).

influences) is rejected, then all observations and positions are equally reliable, valid or defensible (or little). reliable, not very valid and not very defensible) and, therefore, it would be meaningless to write a critical review. Unfortunately, postmodernism has not only inspired humanist enemies of the notion of the wild, but has too often infected its defenders (via counterculture, deep ecology, leftism, etc. .).

Second, in relation to the latter, the allusion to the supposed influence of nineteenth-century capitalism in the "central role of competition as an evolutionary mechanism" in Charles Darwin's theory is another indication of the ideological bias of the author of the review. Criticisms of the allegedly excessive importance given to competition in Darwinism are a typical refrain of postmodern biological revisionism. Biological competition has never married well with leftist worldviews, based exclusively or mainly on equality, solidarity, peace and cooperation. However, biological competition exists, it is not an invention of Adam Smith or Thomas Malthus, and it plays a very important role in biological evolution, although it is not necessarily the only factor, nor is it always as simple as many, including postmodern revisionists like the author, seem to believe.

And third, at a certain moment in the text the author uses a peculiar term: "andropocentrism", supposed hybrid between "anthropocentrism" and "androcentrism" (that is, "machismo"), which reaffirms the impression that he is excessively influenced by the postmodernism. More specifically, by the so-called ecofeminism in this case. Practically only ecofeminists (or should we in this case say "ecofeminists"?) use the word "androcentrism" to refer to the male supremacy over women and the rest of Nature, supposedly prevailing in the so-called society patriarchal.

With these postmodern leftist leanings and influences, it is not surprising that the author ends up clumsily denying objectivity in trying to combat Botkin's fallacies.

REVIEW OF DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE 21ST CENTURY.

By Stan J Rowe²

Daniel Botkin's recent book *Discordant Harmonies: A New Ecology for the 21st Century* (1990, New York: Oxford University Press)³ has generated much interest. For a book that aims to introduce ecology into the 21st century, its tone has the unmistakable accent of the late 19th century. As if transported back 100 years, we heard the voice of Victorian Darwinists whose ideal of civilization depended essentially on the vigorous conquest of nature by science and technology. *Discordant Harmonies* echoes this approach: "We have the power to shape nature and transform it into whatever we

² Translation of "Book review: *Discordant Harmonies, A New Ecology for the 21st Century*" by Último Reducto. The original review appeared in *The Trumpeter* #4 (1995). © 1999, *The Trumpeter*. N. from t.

³ There is an edition in Spanish: *Discordant Harmonies: a new ecology for the 21st century*. 1993. Accent Editions. N. from t.

want.” ”Nature in the 21st century will be a nature created by us.” “We are not taking an engineering approach to nature, we are not borrowing the ingenuity and skills of the engineer, which is what we should be doing...we need to equip the cockpit of the biosphere with the necessary instruments.”⁴⁵ In the United States, these messages sound like Gifford Pinchot’s end-of-the-century philosophy: control, management, and prudent use of resources. After 100 years of exploitation, Intelligent Use⁶ continues to be the watchword.

Botkin is a ”population ecologist,” that is, an ecologist who is primarily interested in the rises and falls in populations of species and their causes. During his career he has discovered that the populations of elephants, moose, fish, sea otters and trees do not remain constant over time. If they are left to their own devices in nature, they do not multiply until they reach a fixed equilibrium point. Rather their sizes fluctuate, not regularly, but randomly. Therefore, populations tend to be unpredictable and their periodic oscillations are closer to the appearance of random numbers, as in a game of dice, than to the pursuit of an optimal state. If nature is fickle, says Botkin, then nature does not have any preferential status and does not offer humanity fixed goals, guidelines to follow. Therefore, people must take control of the planet, choosing wisely and prudently the goals to pursue, using science and technology for the task of global management. Old myths and metaphors that get in the way of this “factual” worldview must be discarded. Then progress can be made, civilization can advance and make the world comfortable and pleasant for all of us.

That Botkin sees the world through the lens of a population ecologist is indicated by his simple equating of the behavior of populations of species with the ”behavior of Nature.” However, when he thinks about it, he says that nature, taken in its broadest sense, is the biosphere. Are, therefore, the populations of animals and plants good substitutes for “Nature”, that is, for the biosphere or ecosphere? Does the inconstancy of population sizes imply that the ecosphere itself is inconstant? This raises a more fundamental question: what is the relationship between populations and the ecosphere?

⁴ See pages 170-178 for the similarity between Botkin’s views and those of the Victorians.

⁵ See pages 170-178 for the similarity between Botkin’s views and those of the Victorians.

⁶ “Wise Use” in the original. The idea of prudent, wise or intelligent use of natural resources, defended by resourceists like Pinchot, has been used decades later as a slogan by the ”Wise Use movement”, a pressure group and social movement that appeared in response to the approval of different laws that protected public lands or regulated their use. This movement brings together different sectors of the American right, financed by extractive industry companies, who defend that the economic and social well-being of humans should take precedence over the protection of nature and that there is no type of objective or material limit to the growth and progress. Botkin is considered an ideologue of this movement by certain environmental authors, such as George Sessions (see ”The wild, the cyborgs and our ecological future”, in *Untamed Nature* -[<http://www.naturalezaindomita.com/textos/lo-salvaje-los-ciborgs-y-nuestro-futuro-ecologico->][<http://www.naturalezaindomita.com/textos/lo-salvaje-los-ciborgs-y-nuestro-futuro-ecologico->]). Indeed, counter-ecological equilibrium theories, echoed by some naive ecologists and critics of modern technology, are all too often used to justify human intervention in ecosystems and technological management of ecosystems. the biosphere. *N. from t.*

The ecosphere (biosphere) is understood as the planetary system made up of life, the world as a material entity that has evolved over some 4.6 billion years. It is a structured object; the gaseous air covering the liquid sea and solid land, with the organisms grouped mainly at the boundaries between the gaseous, liquid, and solid phases. More and more evidence is accumulating that all parts are interactive and symbiotic. The compositions of the atmosphere, the hydrosphere and the lithosphere show unmistakable signs of organic contributions, at the same time that organisms exhibit clear signs in their bodies of contributions from the air, water and soil. In order to understand the ecosphere, it is convenient to divide it into volumetric sectors at various scales, such as oceans, continents, regions or landscapes. For these divisions to be *functional* parts, they must have the same structure-composition as the ecosphere: air over water or land and surrounding organisms. Each ecosystem is a three-dimensional object that can be studied; a piece of land full of life.

Rather than entire ecosystems, ecologists often prefer to study less complex and more easily isolated organic parts: groups of individuals of the same or different species that occur together as populations or communities. But are aggregations of organisms *themselves* suitable objects of study for science?

The erroneous acceptance of populations

In the context of the real spaces of the Earth (that is, of the sectors of the ecosphere), any population is a *selection of similar organic objects* isolated from the functional ecosystem within which they live and without which they would perish. A population is a taxonomic category, usually defined as those members of a given species that are in contact with each other. It is an artifice of thought in the sense that no spatially associated grouping of organisms has an existence apart from the air-soil-water-food ecosystem that maintains it. A population *per se* is not a functional *entity*. Botkin criticizes Clements' idea of plant formations as superorganisms, and his own words could also be applied to populations. "There is no inside and outside of a superorganism," he says, and "if there are no precise boundaries, then the superorganism cannot really exist." Like the Clementsian plant community, the population lacks an interior and an exterior, has no physiology (internal) or ecology (external) comparable to those of an *individual* organism or an ecosystem single.

The erroneous acceptance of populations as suitable objects of study is due to the fact that they can be counted and recorded on graphs. Although populations are not *structural-functional* objects, they have characteristics *relative to their composition* that are easily quantifiable and mathematically treatable. Once defined as "wolf packs," "deer herds," or "aspen groves," population sizes can be measured and analyzed for patterns and trends, constancy and inconstancy, and correlations with certain environmental "factors." selected. According to Botkin, the relevance of population studies could be improved by better analysis techniques: stochastic models, "intelligent" computers. This too will fail. No study of populations *per se* can add to understanding unless it is accompanied by close attention to the "units of nature on the face of the earth" that maintain and sustain species; that is, without focusing primarily on the

geographic ecosystems in which species have evolved and remain. Therefore, reliance on studying population sizes over time to prove or disprove nature's capriciousness is a mistake. Populations do not represent nature and, thus, the main and tacit thesis of the "New Ecology" does not hold.

Indeed, a section of the book devoted to endangered species offers support for the argument that the character of Nature cannot be judged from changes in population sizes, even if its ultimate implications are not recognized by the author. . Comparing the imminent extinction of the California condor⁷] to the recovery of the whooping crane⁸, Botkin points to the importance of "habitat". He says whooping crane habitat "is intact and self-supporting" in northern Alberta and along the Texas coast, while condor habitat in California has been all but destroyed. We see, he says, that "*habitat status is more important than mere population size*" (italics added). "The conservation of endangered species is... understood as something more dependent *on the idea of an ecosystem* than on the simple analysis of populations."

According to this last statement, populations are real entities that can be analyzed. On the contrary, the ecosystem (the basic home or habitat of organisms) is more "an idea" than a living piece of the ecosphere. In Botkin's lexicon, ecosystem is synonymous with "complexity"; that is to say, of that vaguely external and common to the species and the populations that constitutes their food and their refuge. He conceives of the cranes' summer ecosystem as *an idea* of complexity, not like the calcareous wetlands in the boreal forest that cranes depend on for summer feeding and nesting. According to this, the complex ecosystem that exists in the "intact and self-sustaining" northern forests does not deserve to be taken into account in the debate as an example of the reliability of nature, while the population of cranes - the fluctuating size of their migratory population as he confronts the shotguns and the electric wires - he once again demonstrates the inconstancy of Nature.

The most constant face of Nature

Nature, understood as the ecosphere and its sectoral systems, presents a different face from that of the populations of organisms that are assumed to be their substitutes. Consider any terrestrial ecosystem, such as a native grassland, as a gigantic terrarium. It is based on a surface geological stratum, a land formation whose top layer is soil: which changes slowly and, throughout the lifetime of a human being, remains reasonably constant, both internally and externally, in terms of set of organisms it maintains. On the surface, the weather changes from day to day, but the climate shows many regularities: evapotranspiration exceeds precipitation, rains usually peak in June, frosts begin in September. Certainly, the floristic and faunal composition varies following

⁷ *Gymnogyps californianus*. N. of the t.

⁸ "Whooping crane" in the original. *Grus americana*. N. from t.

cycles of drought and humidity, but, despite the fact that the populations of grasses⁹, voles¹⁰ and falcons vary from one year to the next, the A densely complex system made up of several hundred species of plants and animals survives as a *prairie*, in a balance between the fixed and the fluid. In other words, the "stage" of soil-geology remains in place, the "actors" constituted by the flora and fauna come and go between the stage and the backstage, the "play" of the prairie ecosystem, 10,000 years long, continues. Does it make nature fickle and in need of control and manipulation that June rainfall and the exact amount of grass produced cannot be predicted *exactly* a year in advance?

Botkin's answer to the above question is a "Yes!" resounding, giving a strong impression that he is looking for reasons to justify the management philosophy: imperfect nature needs to be perfected by man. Scattered throughout the text are several dozen statements of principle that, when brought together, form a jarring theme with the history of the ecosphere: Under the guidance of science and using the tools of technology, humanity will astutely set goals for the entire planet, managing it wisely and prudently for the advancement of civilization. Therefore, the goals are *omniscience and total control*. According to this way of seeing things, nature is so inconstant that, to date, man (andropocentrism¹¹ here is intentional) has never been able to predict -population by population, species by species- the sizes that will be the following year, nor to successfully intervene as a manager to achieve the established production goals.

A specific thesis of this book is that until very recently humanity has mistakenly viewed the world as something stable, as something that remained naturally in a state of equilibrium, as something constant over time. Botkin is the ultimate prophet who has come to reveal the truth to us, urging the masses to reject the error of this static perspective. Although animal populations are his main examples, he also presents the ups and downs of some other phenomena to prove his hypothesis that nature is erratic and unreliable. For example, temperature patterns over the last million years "show no constancy, no simple pattern, and no regular cycle." However, something that suggests otherwise is that the recorded temperatures, which fluctuate within the range of only six or eight degrees over the last million years, reflect a remarkable stability. Furthermore, Botkin reports that "it has been assumed that the biosphere is in a stable state in relation to carbon (but) recent information shows -to the contrary- that the level of carbon dioxide in the atmosphere has varied over time." of thousands of years." This may be so at the parts-per-million level, but the fact is that the overall composition of Earth's atmosphere—the ratio of nitrogen, oxygen, and carbon dioxide—has been remarkably stable for hundreds of millions of years.

As a third example, Botkin discusses the postglacial vegetation history of the Boundary Waters Protected Area for Canoes (PCBW), in which paleobotanical records show that the composition of the forest has changed half a dozen times or more since the ice

⁹ "Spear grass" in the original. Common name given in English to various species of the Poaceae family. *N. from t.*

¹⁰ "Gophers" in the original. Rodents of the family Geomyidae. *N. from t.*

¹¹ "Andropocentrism" in the original. *N. from t.*

retreated. "If the goal were to return the APCBW to its *natural* state, which of these (post-glacial) forests should be chosen?" he asks. The answer is obvious: let us choose the forest of the last thousand years, since it is certainly better adapted to the current physiography and climate than the others that preceded it. Botkin chooses to ignore this response and ignore the ecology of landscapes. This would destroy his argument that capricious nature offers no guidelines and therefore management should respond only to *what people want*.

Misconceptions

Botkin is criticizing the idea of an *exact, precise* and *fixed* equilibrium state in nature; a point of view that certainly few defend today. At the same time, he admits the absence of clear meanings for "constancy" and "stability" when applied to populations, communities, and ecosystems, "and [that] the difficulty increases in this order." Some notions about scale and time, important but only briefly mentioned, would have clarified these concepts; for example, weather (short term) is inconstant and climate (long term) is relatively constant. In any case, the evidence that, to date, humanity has been confused by false ideas about stability, balance, and constancy is weak. The statement, "Until a few years ago, prevailing theories in ecology either previously assumed, or had as a necessary consequence, a very strict concept of an ecological system, which was in a highly structured, ordered, and regulated steady state," seems to miss the emphasis on dynamics that, from the beginning, has dominated American ecology. The idea that disturbances, such as fires or floods, are an integral part of natural ecosystems is nothing new. Perhaps one explanation for Botkin's repetitive lecture is that his main target is wildlife ecologists who cling to simple mathematical models of population growth: the logistic equation¹² and the Lotka-Volterra equation [1309]. However, are improved models for simulating population fluctuations a sufficient basis for "A New Ecology for the 21st Century"?

"The reasons why we have failed to manage wildlife and other renewable resources are based not just on facts... but on unseen beliefs. We have to confront the assumptions that have dominated our perceptions of nature. Botkin claims that humanity is the victim of false myths and metaphors that have prevented everyone, including scientists, from facing the facts. The facts, he repeats, are that nature is inconstant, since, on all scales of space and time, everything changes continuously. Structures are ephemeral, only processes are constant. The old myths and metaphors, the false beliefs that prevent people from facing the facts, are two: nature conceived as something ordered by God and static, and nature conceived as a machine that is in a stationary state.

¹² The logistic or Verhulst equation is used in ecology to make mathematical models of population growth. Its differential form is: $dP/dt = rP(1 - P/K)$, where r is the growth rate and K is the carrying capacity of the ecosystem for that population. *N. from t.*

It seems that the correct new metaphor is nature conceived as a computer, which Botkin describes as an "organic" model. For example, bacteria can exchange DNA and thus "can be considered to be *nothing else* than *bits* of memory in a computer operating on a planetary level. Computers are offering new metaphors, not just for bacterial life, but for our entire perception of life on Earth, from how we view bacteria to how we view ecosystems and our overall life system. planetary life support. In this and other ways, computers are revolutionizing our concept of nature, our perception of our relationship with nature, and our ideas about managing nature" (emphasis added).

Here is a devoted computer maniac speaking, who no longer sees a computer as a machine, but as an organism! By giving organic qualities to the computer, Botkin manages to swim and put away the clothes: he renounces the outdated mechanistic ideas of the industrial age while affirming that we no longer need to continue to oppose engineering and technological progress. "Technology (read 'the organic computer') brings a new panorama before our eyes!"

The serious mistake

Beneath this thinly camouflaged "neo-mechanistic" view of nature lies a more serious error. In his critical analysis of "nature understood as divine order," Botkin examines the question of how science contributed to the misleading idea of a wonderfully ordered universe. How, in short, did *science*, which deals with the "what" and the "how" of things and not the "why" of metaphysics and religion, manage to sustain the unsustainable? His explanation is that religious beliefs about the character of biological nature infiltrated science. The idea of a discrepancy between a "scientific age" and the myths with their "erroneous perspectives" implies that science is only occasionally misled by deeply buried false beliefs and that most of the time science produces purely objective and free truths. of cultural influences. This is simply false. Science is a social activity and scientists are never immune to the deep beliefs of the culture in which they live. An oft-cited classic example is the influence, in an environment of burgeoning capitalism, of the theories of Adam Smith and Malthus on Darwin's idea of the central role of competition as an evolutionary mechanism.

Another face of the decisive influence of culture on scientific discoveries is the primacy of theory over facts, of paradigm over what seems real. Botkin is dismayed that people have not faced the facts, but instead have been influenced by false theories. However, all facts are loaded by theory - theory leads and facts follow. This is true at the most basic level of perception, in which what we observe (factual vision) is conditioned by previous concepts, theories and beliefs. Psychologists tell us that "to believe is to see" not that "to see is to believe". Botkin criticizes the ornithologist David Lack for looking for facts that fit his theory, but that is what we all do, including scientists. The facts that Botkin adduces in support of his "New Ecology" are those that he has carefully selected to accord with the theory of the inconstancy of nature that he has chosen to espouse. Critics who find both his theory and the implications he draws from it shallow and dangerous can find plenty of facts to refute it.

The cultural environment from which Botkin's deep beliefs and myths are inseparable is the affluent American consumer society. As a full member of it, he must reject the idea of a well-balanced and orderly universe, for if "nature knows what it is doing," then humanity's role is to withdraw, let it be, do nothing, or, at least interfere as little as possible in the ecosphere - which is taboo for the management company. The adoption of such a radical idea would put applied scientists, resource managers and technocrats out of work. On the other hand, the idea of a fickle and disorderly nature, in which chance plays the main role, perfectly fits the management society, whose purpose is to control, exploit and grow. In fact, a variable nature that does not exhibit perfectly stable characteristics, nor fixed equilibrium points, *requires* intervention everywhere. Hence Botkin's repetitive message: Let's embrace technology and prepare to manage the world, species by species. "Under the new management," he says, "you start with the question: How many sea otters is enough?" Nowhere in the book is a more fundamental question asked: "How many people is enough?" Nowhere does it raise the idea that humanity's role could be to maintain healthy ecosystems, managing as sensitive gardeners those that are used, so that their creativity and productivity - for sea otters and for everything else on Earth - can continue according to the reliable old way.

From the title to the beginning of the last sentence of the book, "Nature in the 21st century will be a nature created by us", perceptive readers will recognize the goal towards which Botkin would like to lead us -since everyone has seen it in Star Trek. It is the so-called "space and information age", also known as the Anthropocentric Technocontrol Age. That Botkin is able to infer this vision of a brave new world from the simple observation that populations fluctuate credits his ingenuity.

Several of the goals it proposes for humanity are commendable, such as preserving biodiversity: "the true objective of our efforts is the maintenance of life"; and maintain the ecosphere: "people living in nature, not poisoning it or destroying its reproductive capabilities." His view that "Life and the environment are one thing, not two, and people, like the rest of life, are immersed in that single system" is true, though he contradicts himself elsewhere, saying that "Earth is not alive. His proposal that various types of wild ecosystems¹³ should be preserved is laudable, but he continues to pester the idea of managing them without ever hinting that the solution might be to manage humans, both in regarding your number as your wishes. The suggestion to "minimize the use of new technologies when they lead to new alterations of the environment" is pertinent, especially for those who would like to use them to manipulate and modify the Earth. He is honest in admitting our ignorance about how the "dense complexity" constituted by the multitude of species present throughout the Earth's surface is maintained and has been maintained for so long. The reason - that, in the entire history of the planet, no species has tried to manage the rest - has not even occurred to him.

¹³ "Wilderness" in the original. "Wilderness" refers in English to the areas in which the ecosystems are little or not at all humanized, that is to say, to the wild areas or lands. In this case it has been translated as "wild ecosystems". *N. from t.*

Let us hope that in the 21st century a much wiser “New Ecology” will emerge; one that begins where Botkin leaves off, with one obligation: ”to recognize the limits of our actions.”

Recommended reading

- Rowe JS and BV Barnes. 1994. “Geo-ecosystems and Bio-ecosystems”. *Bull. Ecol. Soc. Amer.* 75(1): 40-41.

Worster, Donald. 1977. *Nature's Economy, the Roots of Ecology*. San Francisco: Sierra Club Books.

Addendum: Humanity's goals to be served by the “New Ecology”, taken from *Discordant Harmonies*.

1) Page 4: Constructive management that, if carried out, could achieve long-term use of natural resources and improve the environment in a way that could be both enjoyable for us and necessary for the survival of the life on earth.

2) Page 11: People living in nature, not poisoning it or destroying its reproductive capabilities.

3) Page 13: Building a great civilization in which our role in the environment is positive, managing natural resources sustainably and improving the quality of our environment... a new advance in the understanding of our environment that leads us to an advance in our civilization.

4) Page 71: Intelligent nature management.

5) Page 89: Making intelligent use of nature. to seek some kind of harmony with our environment in the future.

6) Page 122: Manage our environment wisely.

7) Page 154: Make intelligent use of natural resources.

8) Page 171, chapter 11: Managing the biosphere.

9) Page 182: The maintenance of life. the maintenance of a biosphere that is desirable to human beings. sustain the biosphere to maintain the conditions necessary for the well-being of people.

10) Page 183: A healthier biosphere (which) will vary within a range of conditions acceptable to us or necessary for the continuation of life.

11) Page 189: Make the earth a comfortable home, individually for each of us and collectively for all of us in our civilizations.

12) Page 193: Manage nature wisely and prudently.

13) Page 200: Nature in the 21st century will be a nature created by us.

Thoreau

OR WILD NATURE AS A CIVILIZATIONAL IMPULSE

By Sam Minard

I must admit that as a teenager reading *Walden* by Henry

David Thoreau was perhaps the first spur in my search for an understanding of life and society that has led me to the ideas expressed in this newsletter. It is true that ever since I was a child my mind was seething with an imaginary of Indians, outlaws and vagabonds, but over the years anarcho-syndicalist ideas gained ground that reading *Walden* could at least vaguely reconquer, refocusing my attention on individual freedom, simplicity of life and nature.

With the passage of time, and readings related to the ideas on this page in between, I became aware of the limited scope of Thoreau's ideas and his great humanist vocation.

However, that first good taste in my mouth that reading *Walden* produced in me made me continue to feel a certain appreciation for the figure of Thoreau. This is what recently led me to notice an edition of his speech *Walk*. The text begins nothing more and nothing less than this:

"I want to say a few words in favor of Nature, of total freedom and the wild state, as opposed to a simply civil freedom and culture; consider man as an inhabitant or constitutive part of Nature, rather than as a member of society. I would like to make a radical statement, if I may emphasize, because there are enough champions of civilization already; the clergyman, the school council and each one of you will be in charge of defending it."

What is called a hook start, at least it had me hooked again. This seems to have gone beyond *Walden*'s voluntary simplicity, it seemed that Thoreau and I were once again understanding each other.

However, the few paragraphs that seem related are nothing but pure verbiage and contradiction with the general ideas that the good old Henry David conveys throughout his speech. The defense of wild nature, despite the misleading first paragraph, does not go beyond a need for it as material resources¹ and mainly as a tonic for the spirit². Behind the grandiloquence of Thoreau's words, there is no idea regarding human society that goes beyond the typical ruralist discourse³. Yes, it is appreciated that life in nature is not mixed with the myth of the noble savage. Although it is not surprising since throughout the book you can read apologies for progress and

agriculture⁴. Contradictory ideas with his supposed exaltation of the wild that one ends up despairing and finally coming to the conclusion that Thoreau was nothing more than a charlatan and trickster with unclear ideas and apparently without interest in ordering them.

Reading *Walk* one is reminded of today's environmentalists defending nature for a set of pathetic humanistic reasons. Thoreau at least referred to the wild as a superior value, although he later contradicted himself. This leads me to reflect on the appearance in Europe of "savage" terminology in environmental circles (something more common for a long time in North America), with concepts such as *rewilding*. There may be a greater desire to see complete and autonomous ecosystems, a current within environmentalism may be created that draws our attention for its defense of the wild. Perhaps part of that current is not a bad place to go fishing after all, but we already know that the vast majority will flow to and from positions as contradictory as Thoreau's. Walking clearly shows the danger of perverting the idea of the wild for the greater glory of the spirit and civilized society. The wild can end up being something as empty of content as freedom is today. Therefore, pay attention to this type of discourse that can confuse us at first, and that can distort our message.

Grades

1. *"Civilized nations -Greece, Rome, England- have been sustained by primeval forests, which once rotted where they stood. They survive as long as the land is not depleted."* Walk.

2. *"A city is saved as much by its worthy men as by the forests and swamps that surround it. A municipality with a primeval forest swaying at its side, and another rotting on the contrary, is in a position to produce not only corn and potatoes, but also poets and philosophers for the ages to come."* *Walking.*

3. *"The weapons with which we have won our most important victories, and which should be handed down from father to son as family heirlooms, are not the sword and spear, but the scythe, the turf cutter, the shovel and the hoe to mud, rusted with the blood of many hard battlefields."* *Walking.*

4. *"I think the farmer displaces the Indian precisely because he protects the prairie and thus becomes stronger, and in some ways more natural."* Walk.

Brave new world, 1984 and the techno-industrial system¹

by Karagam

Introduction

A Brave New World and *1984*, two dystopian novels from the first half of the 20th century, presented two different visions of what the social consequences of the great technological explosion that began with the Industrial Revolution. Although George Orwell presented a very pessimistic picture in his *1984*, he had a fundamentally positive view of technology; his starting point was the classical Marxist way of understanding technological development. Thus, the terrible totalitarian-collectivist society that we see in *1984* would not be a result of technological development itself, but the result of its distortion by a totalitarian dictatorship. Aldous Huxley, on the other hand, was concerned with the consequences of technological development itself and its internal logic. There is nothing in *Brave New World* that diverts technological development from its natural course. In *Brave New World*, it is technology itself, through the advances that today's technological propaganda considers "progress", that gives rise to the horrible form of society described in the novel, creating another dystopian society. In this article, we will compare these two different visions of industrial society with the current techno-industrial system.

The society of 1984, the dynamics of its birth and its qualities

When we look at what Orwell says in *1984* through Goldstein (one of the characters in *1984*) we see that his philosophy of history consists of classic Marxist class warfare: the story progresses through the conflicts between the different classes of society. Since the Neolithic, the structure of human societies would have been almost the same along its main lines; there are three classes in societies: the Low (lower class), the Middle (middle class), and the High (upper class). The upper class tries to maintain its position, the middle class tries to replace the upper class, and the lower class is not in a position to think about anything, since members of this class spend most of their time engaged in physical labor. daily. In certain historical situations, the middle class overthrew the upper class. To do so, he enlisted the support of the lower class by instrumentalizing

¹ Translation by Último Reducto of "*Brave New World, 1984, and the Techno-Industrial System*" (April, 2021). Copyright © 2021 Karaçam. Original available in:

concepts such as liberty, fraternity, and equality. But when the middle class replaced the upper class, it transformed itself into a new upper class; a new middle class was formed in its place, and so societies returned to their usual form with three levels. However, the Industrial Revolution, for the first time in history, would have created the possibility of changing this hierarchical structure of societies.

According to Orwell, the Industrial Revolution would have made it possible, for the first time in history, for all social classes to live in material prosperity by vastly increasing society's production capacity. Thus, for the first time, members of the lower classes, who constitute the largest sector of human societies, would no longer need to spend most of their lives performing daily work to satisfy their basic physical needs (food, shelter, fuel, etc.). clothes, etc). The fact that all members of society could satisfy their basic material needs without having to make a great physical effort would guarantee that the standard of living of all people of all social conditions would converge to a level that was previously only possible for the lower classes. tall. When people's material standards of living converged in this way (when mechanical production allowed everyone to own appliances, cars, personal bathrooms, televisions, and the like), the inequalities that arose from the material conditions of society they would make no sense. Everyone, including the lower classes already liberated from material constraints, could develop culturally and cognitively. The social conflicts derived from the problem of the distribution of the scarce resources of society would disappear as a result of the realization of material abundance thanks to technological development and, therefore, the hierarchical structure of human societies would also disappear. Orwell explains it this way:

It was also clear that a general increase in wealth threatened the destruction - indeed, in a sense it was the destruction - of hierarchical society.²

For if leisure and security were equally enjoyed by all, the great mass of human beings, normally stupefied by poverty, would become literate and learn to think for themselves; and when it did, sooner or later it would realize that the privileged minority has no function and would eliminate it.³

Thus, Orwell considered that technological development was positive and good in itself. The material abundance that technological development would bring would make people more educated and better informed, the people who became educated and informed would not want to have a useless ruling class above them and they would eliminate this "parasitic" class, and thus the "freedom"⁴ would be possible. This is the classic progressive view that Marxists have of technological development. The

² *1984*, Part II, Chapter IX.

³ *Ibid.*

⁴ Orwell defines freedom within a leftist and humanist framework. According to this, freedom is to be free from natural physical hardships thanks to the benefits of a human society that has subjugated Wild Nature, as well as not to be under political pressure, not to be exposed to discrimination (of class, race, religion, etc.) and have an income that allows them to enjoy the benefits of human society.

danger that Orwell saw in the future was that this positive dimension of technological development could be distorted by totalitarian dictatorships.⁵

What Orwell points to as the reason for the rise of the totalitarian society of *1984* is the reaction of the upper classes to the technological explosion that began with the Industrial Revolution, which supposedly made possible the abolition of the structure hierarchy of companies. The ruling classes in *1984*, seeing this aspect of technological progress, tried to prevent the appearance of the results described above. To achieve this, they had to prevent, through the creation of a totalitarian system, the productive capacity of society from generating an accumulation of material wealth. In doing so, they nullified the "liberating" power of the machine and ensured that people remained ignorant and poor. The two methods they used for this were the maintenance of a constant state of war between neighboring states, thus preventing the accumulation of the material wealth produced, through its destruction in wars; and the prohibition of free thought and expression to eliminate empirical thinking and creativity, thus stopping all technological progress beyond a certain level.⁶

As a result of this deliberate policy implemented by the ruling classes, the material living conditions of society in *1984* are very bad. The environment in which people live, their houses, the streets and the offices in which they work are physically falling apart. The elevators don't work; electricity is not available during the day and often goes out at night. Monotony and mediocrity prevail in the cities, there is no vitality in society. There is a constant shortage of consumer goods. Coffee, and sometimes soap or razors, can't be found depending on when. The use of consumer goods is subject to quotas, they are supplied to the people within certain limits, and they are of very poor quality. The food is tasteless and the ingredients are terrible and of poor quality.

The political system in *1984* is a one-party dictatorial regime with a socialist and collectivist ideology. Economic activity is fully controlled by the state. Society is divided into three classes: at the top are the party's internal command cadres. These are the ones who shape the ideology and determine the policy to be followed. They live in a special district of the capital and their living conditions are much better than the rest of the population. Below them are the ordinary members of the party who constitute the middle class of society. At the bottom are the "proles", who make up 85% of society. The living conditions of the proles are very bad; they live in a terrible physical environment. (Their conditions can be compared to those of the British working class in the 19th century, at the beginning of the Industrial Revolution.) His only concern

⁵ Orwell seems to have written *1984* as a warning against this threat. Many features of the totalitarian dictatorship described in the book were borrowed from the Soviet Stalinist dictatorship that prevailed at the time the book was written. It seems that Orwell saw the spread of this political system throughout the world as the greatest danger in the future.

⁶ Orwell explains the inability of totalitarian bureaucrats to reduce technology to a point before the Industrial Revolution as follows: Reduce technology to a level below the Industrial Revolution and, most importantly, Stopping the development of military technology would greatly handicap states that did so when competing with other states, resulting in the destruction of their ruling classes.

is surviving each day. His life consists of eating, drinking, football and beer. As they live in constant misery and poverty, they are unable to think and act on more serious issues such as the hierarchical structure of society, political events, their way of life, etc. Because, as has been said before, the main objective of the ruling classes in *1984* is to maintain the physical conditions of the majority at a level of poverty, thus preventing them from developing cognitively and culturally and from having sophisticated demands. ⁷

The political system in *1984* strangles society, trying to control everything through physical pressure. There are no democratic elections and the one-party dictatorship has total hegemony. Other management techniques, such as constitutional rights and separation of powers, have been abolished. The free expression of ideas is never allowed and thoughts are shaped by methods based on physical force. The media is under the control of the party. Everyone has a telescreen (an electronic device similar to a television), which must be present at home, and it is strictly forbidden to turn it off. The party uses this tool both for propaganda and to monitor and listen to the people. In any case, the contents broadcast through this tool are boring and monotonous compared to today's television broadcasts. They do not have the function of today's mass media that captivates people with fun, violence, curiosity, sense of belonging, sex, etc. and they make them forget the dull, monotonous and unsatisfying character of their own lives. Their function is merely to practice propaganda in a vulgar and crude way and to detect those who start to show signs of dangerous thoughts and attitudes. However, when thought control and surveillance is done in this crude and obvious way, as in *1984*, it creates enormous pressure and stress on people and the buildup of this pressure and stress it can bring more bad consequences than benefits for the social machinery. Consequently, the current techno-industrial system has developed more subtle methods for the control of thought and behavior. This electronic device, as Orwell envisioned it, would be far less effective than current methods of electronic thought control. The society of *1984* controls people more through physical pressure than efficient and intelligent propaganda.

The world of *1984* is divided into three superstates: Oceania, Eurasia, and East Asia. These states are constantly at war with each other. The war between the superstates in *1984* is not a total war like the wars of the first half of the 20th century and does not play a decisive role in the daily lives of the citizens of these states. Since these states are huge in terms of geography, population, and economy, they cannot beat each other, and the state of war is chronically prolonged. As we have already

⁷ We see that the masses of the current techno-industrial system, who on average have much better material conditions than the lower classes of *1984*, have a fundamentally similar attitude. Contrary to what progressives believe, the fact that machine-based technology reduces physical labor and increases material well-being does not result in people engaging in "higher" and "creative" pursuits. On the contrary, the indolent lifestyle created by technological development plunges people into meaninglessness and creates psychological problems and dissatisfaction, and to somewhat suppress these problems, people indulge in hedonistic pleasures: consumption, movies, TV series, computer games, pornography, etc.

mentioned above, the ruling classes of these states deliberately continue to wage war in order to keep the material well-being of society in miserable conditions. Orwell wrote *1984* during World War II; this might have led him to think that war would become an ordinary feature of great-power relations in the future. However, the historical development in the real world was very different when it came to warfare. Advances in weapons technology, especially nuclear weapons, made warfare between the great powers extraordinarily costly; We have not witnessed an armed conflict between great powers since the end of the Second World War. On the other hand, states have not become cultural and economic autarchies, as described in *1984*. On the contrary, the development of transportation and communication technologies has accelerated the economic and cultural integration of different parts of the globe and has created an integrated global system with a connected physical infrastructure.

Both *Brave New World* and *1984* emphasize the need to weaken small-scale communities that might exist within complex social systems. The loyalty and devotion of the people should be directed to the social system itself rather than to small-scale communities like family, extended family, local communities, tribes, etc. so that there is no concentration of power anywhere else that can rival the central authority of the system itself. The result of the disintegration of small-scale communities is that the power of the social system as a whole increases, but individuals are weakened by being isolated from one another.

Due to this need, the ruling elite in *1984* tries to eliminate family ties, friendships and other connections between people. Children are educated in ways that make them loyal to the system itself, accepting its values and ideology rather than the values of their families. This is achieved by indoctrinating children from an early age in various educational institutions (educational camps, schools, kindergartens, etc.). This prevents families from instilling in children thoughts and behaviors contrary to the values of the system. In particular, the party does not want children to be loyal to their parents and wants them to be constantly spied on. The children thus become a real problem for their parents: they are ruthless confidants who have infiltrated their homes.

Another method used to weaken family ties in *1984* is the suppression of sexuality. Orwell mentions two reasons for trying to completely suppress sexuality in *1984*: the first is to prevent men and women from relating closely and forming intense bonds through sexuality. The second is that the energy accumulated in people thanks to the suppression of sexuality is used to create a more intense bond with the regime and its ideology. In *1984*, the party tries to reduce sexuality to a strictly functional and mundane activity of procreation, 8 necessary to perpetuate the social system.

Orwell describes in *1984* a society that puts enormous pressure on its members from all angles. People live in poor material conditions and the party strictly dictates and controls what they wear, what they say, how they work, their sexuality and even what they think. Orwell considered that all this would be necessary if future technological societies also wanted to maintain their hierarchical structure. Because he believed that

technology, if allowed to take its natural course, would play a supposedly liberating role. According to Orwell's socialist point of view, the "perfect" society would be born through the increase in material well-being created by technological development. The production of machines would free people from the need to strive to satisfy fundamental basic needs, and thus make it possible for all sectors of society to develop cognitively and culturally. Thus, the "free" and classless society that left-wing ideology dreams of would become possible. Only a totalitarian dictatorship could maintain modern technology and hierarchical society at the same time. Orwell envisioned an industrial society that would suppress thought and expression, have miserable material conditions, and try to maintain internal political stability through xenophobic hatred and war. And his counter-ideal would be another industrial society that has been dreamed of by progressives since the advent of the Enlightenment: a society with material abundance and which would give its members the "freedom" to consume this material abundance; a society that would be democratic, peaceful, and whose members would be culturally sophisticated.

However, technological progress itself -as correctly predicted by *A Brave New World* and the development of the current techno-industrial system has shown-, despite the improvement in material conditions, the increase in consumption possibilities, of the

The society of *Brave New World*, the dynamics of its birth and its qualities

Huxley's *Brave New World* shows us what the consequences of advancing technology can be when it follows its own internal logic, without being thrown out of its way by an evil dictatorship.

Brave New World takes place in the year 632 after Ford. The person referred to here is Henry Ford. Ford is a sacred and religiously worshiped character in *Brave New World*. The importance of Henry Ford in the real world is that he used the first moving assembly line in his car factory. That meant a revolution in industrial production methods. Huxley regarded this as one of the most important factors that would shape the future of human societies. And indeed, the assembly line method has formed the basis of industrial production and mass consumption. In this production method, the merchandise to be produced is standardized; complex jobs are broken down into simpler mechanical processes, and standard products are made on assembly lines staffed by unskilled workers. The tasks performed by these workers are reduced to simple mechanical movements. This method involved a huge increase in production capacity and consequently created the need for mass consumption. The industrial mode of mass production and the need to consume the commodities it produces created a cycle in which production and consumption were closely linked and shaped the characteristics of the way of life in industrial societies: individuals became mechanical laborers who were part of a large collective in working life and consuming in their "free time" the products created by this mode of production became the only meaning of their lives. Mechanical work and hedonistic consumption became the gears of a self-

reinforcing engine. In *Brave New World*, Huxley shows us the logical consequences of this process.

The *Brave New World* Society is a project made after the world economy and human civilization nearly collapsed due to war. It was recognized that the reappearance of a similar danger could only be prevented by a universal society scientifically planned and organized on a global scale. To avoid social and economic crises and new wars, it was necessary to build a global society that provided stability. And to achieve stability, the members of this social system should be fully integrated and adapted to it; and feel happy and satisfied with it. To achieve this purpose, people should live in an environment where they do not feel any "negative" emotions. To this end, the society of *Brave New World* satisfies the physical needs of the people (for this it is enough that the individuals fulfill the simple roles for which they have been produced) and they spend their lives enjoying themselves. of entertainment and consumption. Psychological problems such as boredom, depression and the lack of meaning that this type of life entails are tried to be eliminated with sex (its reproductive function is suppressed to turn it into a simple hedonistic pleasure), the consumption of merchandise, vacations and "sensoramas"⁸ (an electronic entertainment technique quite similar to today's electronic entertainment, such as movies, television series, music, videos, etc.). People's minds try to keep themselves constantly occupied with fun and pleasure in order to suppress negative thinking and emotional states. In case people are still feeling afflicted despite all these diversions, a psychoactive drug called soma comes into play. Thus, *Brave New World* society tries to maintain an uninterrupted euphoric state of mind among its members to guarantee social stability. People are biologically conditioned in such a way that they do not have any desire that society cannot satisfy, and whatever desire they have will be satisfied by society. They eat and drink what they want and have sex with whom they want. They do not care about competition and success because their place in society is predetermined by it; they are produced according to the role they are going to play in that society. They have no families, wives or children; therefore, the intense emotional states, such as sacrifice, jealousy, and longing, that these close relationships can bring about, do not exist. They indulge in hedonistic pleasures after doing a monotonous job that requires no talent or initiative.

Chain production is also used to produce human beings. People are designed for the roles they are to assume in society and are mass-produced as commodities. The people who are going to perform the most monotonous physical tasks are produced by the Bokanovsky method as exact copies, identical to each other. Huxley stresses here the death of individuality at the hands of the cycle of mass production and consumption. People who make exactly the same mechanical movements while working try to amuse themselves with the same entertainment: sensoramas, soma, orgy-porfia⁹.

⁸ "Feelies" in the original. *N. from t.*

⁹ "Orgy-porgy" in the original. *N. from t.*

The standardizing force of *Brave New World* society is shown in the Bokanovsky groups: mass-produced groups of people, genetically identical and without individuality.

The sexual politics of *Brave New World* is completely different from *1984*. In *1984*, the goal is to suppress and reduce sexuality to a social task performed solely for the purpose of reproduction. In *A happy world* the goal is to turn sexuality into an act performed solely for pleasure and entertainment, separating it from reproduction. Sexuality is encouraged from a very young age. The society promotes contraceptive methods and thoroughly educates women about them. Having an active sex life is what society expects of people. But relationships must be short-lived and people must change partners frequently. The family has been completely eradicated in *Brave New World* because the new generations are produced in factories; people don't have children, and relationships are short-term. The society of *Brave New World* definitively solved its need to eliminate small-scale communities (a need that every complex society faces, as we mentioned earlier) by severing the ties of sexuality with reproduction, producing people in factories and thus eradicating the family. In *Brave New World*, no one belongs to one particular no one, but everyone belongs to everyone else. The individual is part of the social collective from its production until its death. Spending time alone, doing something alone, is considered a very strange and antisocial attitude. The individual is expected to lose himself in the social collective and to give up all his uniqueness.

Huxley shows that the consequences of technological development, generally regarded as "positive" (the increase in material "wealth", the increase in consumption, and the eradication of negative emotional states through various techniques of entertainment and drugs) are not positive at all. ; and the real consequence of all this is the reduction of life to a meaningless drug-induced dream. Because in life as it is in *Brave New World*, where all desires relating to physical needs and pleasures are satisfied by the social collective without significant effort on the part of individuals, where people lives in constant amusement under a perpetual pleasant stimulus and where all deep personal relationships have been eradicated, there is nothing left for people to achieve with their initiative and abilities and experience as their own. The feeling of lack of meaning and boredom that this life creates is tried to alleviate through "feelies", sexual orgies, psychoactive drugs such as soma, etc. In that society, people are never alone. But relationships between people are reduced to such a superficial state that they do not include any strong emotions like jealousy, anger, passion, nostalgia, love, devotion, etc. In such a life, there is no place for desire, ambition, the desire for success and victory. That means the eradication of all possibilities of freedom and meaning in life.

As we have seen, Orwell thought that the increase in material well-being would result in the expansion of the cultural and cognitive capacities of the masses - the supposed result of technological development when it was not perverted by a totalitarian bureaucracy. But Huxley showed that despite rising material levels, it would still be possible to keep most people ignorant and superficial; and that the multitudes, if they were "emancipated" from harsh living conditions, would not automatically aspire to a "high" culture and consciousness. For what does a "high" culture and conscious-

ness mean in a society like *Brave New World*, where ability, initiative, strong human emotions, and life itself are meaningless and human beings lead a comfortable and purposeless life? Huxley answers this question in his novel with a discussion of Shakespeare. Shakespeare produced much deeper and more sophisticated works of art than those prevalent in *Brave New World*. Because in Shakespeare's time, relationships between people were dense, life with its difficulties and dangers was an adventure. It was necessary to fight to achieve success and be satisfied. And what makes life meaningful and worth living is precisely this. Otherwise, if life is like in *Brave New World*, people numb their conscience instead of cultivating it, hoping to forget that meaningless life.

Huxley contrasts a reserve for savages with *Brave New World* society. In *Brave New World*, technologically advanced society has spread to all those parts of the world whose resources can be economically exploited; the only areas left unsubdued are the feral reserves. The technological level of the human communities that live in the reserves is not advanced. The people here are horticulturists. There are no centralized and bureaucratic structures and the external world is not managed and regulated by large organizations. People have a more individualistic character. They don't belong to a huge community, but they belong to themselves and their loved ones. Here people are not products manufactured by society and continue to reproduce naturally. Wild animals continue to live freely in these reserves. Wilderness reserves are the only antithesis left to the planned, regulated, insured, antiseptic and controlled *brave new world*.

They are the places where Nature, outside the control of technologically advanced human civilization, has its own will.¹⁰

Therefore, this area is antithetical to *Brave New World*, and the latter's evil character can be understood and revealed only by comparison with a place outside of its control. However, Huxley does not idealize this place; because what makes the society of *Brave New World* a nightmarish dystopia are its seemingly "perfect" qualities and therefore the wildling reserve must be shown in all its aspects, both positive and negative. Diseases, old age that cannot be hidden with technological tricks, the need for physical exertion, wars, fights, etc. They are part of life in the wildlife reserve. True freedom comes at a cost, and that is precisely what makes it possible.

The current techno-industrial system

The modern industrial system was born when human societies began to use energy from fossil fuels. Steam engines offered human societies the possibility of using the energy concentrated in coal, and internal combustion engines have done the same for oil. The enormous amounts of energy concentrated in fossil fuels created an explosion

¹⁰ In allusion to one of the etymologies of the Anglophone term "wilderness" [land or wild area] that would refer more or less metaphorically to a "land with its own will", that is, autonomous. *N. from t.*

in the development of human societies, exponentially increasing production, communication and transportation capacities. First the railways and then the highways made it possible for the industrial system to cover ever larger areas. The use of fossil-powered engines in factories made industrial mass production possible. Huge machines running on the power of oil have made it possible to mine vast quantities of minerals and process them in quantities that were not possible before. The railways, the trucks, the large container ships, the gigantic machines used in construction and production have changed the face of the earth and of societies. The industrial system began to spread rapidly, subjugating and replacing wild Nature. The techno-industrial system was fully established on a global scale during the second half of the 20th century; and thanks to advanced communication and transportation technologies, it has become an integrated whole that encompasses the entire planet, despite containing different communities with different political, institutional, and cultural backgrounds.

This highly complex global social system forces people to live in ways and environments to which they are not evolutionarily adapted. The techno-industrial system is a social order with a huge population, in which urbanization and specialization have reached extreme levels. It needs iron discipline and advanced collective organization to function. People have to carry out tasks (jobs) that are shaped by the needs of this rigid organizational framework and they must behave accordingly. But these tasks are not satisfactory for most; they reduce people to pawns without initiative, mere cogs in a gigantic machine. The constant growth and technological development inherent in the techno-industrial system create a world in which times pass quickly and space shrinks rapidly. This creates in people an emotional state of uncertainty, insecurity and anxiety. The collective nature of the system destroys small-scale communities. *Homo sapiens* is evolutionarily adapted to live in this type of community and to identify with it. The destruction of small-scale communities produces the paradoxical isolation of the modern individual. The rapid destruction of natural ecosystems and their replacement by artificial environments traps people in synthetic environments for which they are not evolutionarily adapted. Therefore, people do not naturally accept the living conditions that the techno-industrial system creates. The system has to convince and force them through various techniques (propaganda; motivations such as material wealth and status; surveillance and physical imposition techniques; etc.) to behave according to its demands.

The methods that *Brave New World* society uses to shape human behavior begin with the production of people according to the roles and place they will occupy in society. The current techno-industrial system does not intervene (yet?) directly in the human genome because currently the information on the biological factors that shape human behavior is still limited. The consequences of this type of direct intervention would be quite different from what was intended and could create more problems than benefits for the system. Therefore, the techno-industrial system, instead of direct biological intervention, uses some other methods to relieve people's dissatisfaction and control their behavior. These intervention methods consist of two main layers. The

methods found in the first layer and directed to the great masses of people¹¹ are quite similar to those of *Brave New World*: electronic entertainment (Internet, music, series television, movies, pornography, etc.), hedonistic pleasures (consumption of merchandise; tourism sector with its all-inclusive restaurants and hotels; etc.), hobbies, the pseudo-satisfaction of the need to belong to a reference group through methods substitutes (soccer fans, social activism, political parties, etc.), absorption of rebellious feelings or even conversion of them into beneficial attitudes for the system through leftist ideology, etc. And, when all this is not enough, the application of psychoactive drugs.

In techno-industrial society, the first layer of control techniques (entertainment, distraction) is both possible and mandatory. It is possible because this social system can physically support its huge population using only a tiny fraction of its energy and material resources. Once the most basic physical needs of its members are met, it can still allocate resources to control techniques found in the first layer. But these "entertainment" functions of the system should not be seen as superfluous expenses that could be diverted to more "necessary" or "useful" functions. They have a "justified" place in the huge social machinery and are as essential to its functioning as other indispensable sectors, such as industry and agriculture. With advances in food production technologies (agricultural machines, artificial fertilizers, pesticides, etc.) it became both possible and mandatory to create a huge industrial sector in addition to and above the agricultural sector. With advances in manufacturing technologies (mobile assembly lines, computer-controlled automation, etc.) it became possible and mandatory to build a service sector in addition to and above the industrial sector. However, the different sectors of the techno-industrial system are not superficial and superfluous additions to more useful and necessary functions. Each technological advance in a particular sector makes other advances in other sectors necessary for its operation. To feed billions of people, industrial farming techniques are essential. Industrial agriculture requires tractors, harvesters, artificial fertilizers, pesticides, etc. Agricultural machines need oil to function, and oil must be produced through complex extraction and refining procedures. These machines and their spare parts can only be produced on a large scale in huge manufacturing plants. Artificial fertilizers and pesticides can only be produced in chemical plants. All these industrial manufacturing activities require control, supervision, management of human and financial resources, legal representation, public relations, advertising, etc. All this is done by engineers, accountants, experts in human and financial resources, lawyers, advertisers, etc. The service and manufacturing activities of the techno-industrial system bring people together in large cities. Motor vehicles are needed to move these people to their jobs and bring food from rural areas to cities. This creates the need for cars, trucks, trains, etc. This huge transport network needs

¹¹ With advances in computer technology (such as machine learning algorithms and increasingly powerful processors), the system has also begun to target individuals individually when applying its seduction methods. Content designed for specific people on *websites* for shopping, video streaming, etc., is becoming the norm.

controls, regulations, certificates, standards, etc. to work. To build and maintain the infrastructure (roads, bridges, energy transport networks, communication networks, etc.) necessary for all these activities, taxes must be collected and properly invested. State structures, with their bureaucracies and institutions, are necessary to execute and supervise all these investments.

Therefore, the techno-industrial system is a gigantic machine with all its constituent parts connected and they need each other to function. People have to fit into a rigidly defined hole in this gigantic machine. The hole they fit into requires them to follow strict standards, workplace rules, strict calendars and hours; it forces them to do their job in a way that is tailored to the needs of the social machine. This situation reduces people to being mere pawns without initiative. They are not in a position to define their own goals and pursue them using their own autonomy and capabilities. And the tasks they perform are completely disconnected from the needs that are most important to them (like food and security). They are highly specialized tasks that border on the absurd, without any relation to the practical necessities of life. This lack of initiative and autonomy, the impossibility of using one's capacities to satisfy the most important practical needs, is disturbing a vital biological need called the power process¹² The disturbance of the power process creates feelings of boredom, of lack of meaning and psychological problems such as depression, feelings of guilt, eating and sleeping disorders, etc. These problems make people less effective when it comes to fulfilling the roles they must assume in the social machinery and even lead them to show antisocial behaviors that negatively affect the proper functioning of the system. The first layer of control techniques (entertainment, distraction) of the techno-industrial society is necessary to alleviate this psychological discomfort and keep people going, drowning their negative emotions under an incessant barrage of sounds and images. For this reason, these control techniques are useful so that the system can limit the prevalence of these behaviors that would be highly detrimental to its operation. Of course, these distraction mechanisms cannot bring complete satisfaction to people's lives, nor can they eliminate all harmful behaviors. Psychological problems such as anxiety, stress, boredom, emptiness, meaninglessness, depression continue to afflict individuals.

The *1984* system roughly controls human behavior by displaying its physical strength at every moment, and does not stifle discontent with "entertainment" as the *Brave New World* system does and the current techno-industrial system. Because, as we have seen above, Orwell thought that material wealth and the resulting free time (freedom from work necessary to satisfy basic physical needs) would bring about the elimination of hierarchies and the realization of "freedom." Orwell's *1984* system, in order to preserve the hierarchical structure of society, controls people through direct

¹² For a more detailed definition and discussion of the power process, see: Theodore John Kaczynski, *Industrial Society and Its Future*, paragraphs 33-37. [There is an edition in Spanish: *Industrial society and its future*, Isumatag, 2011. *N. from t.*].

physical coercion and does not use the diversionary techniques that constitute the first layer of our classification . The modern techno-industrial system combines Orwellian (physical coercion, technological surveillance, crude propaganda) and Huxleyan (distraction through entertainment and physical pleasures) techniques of control. Because under the first layer of control techniques that we mentioned above, there is a second layer of control techniques consisting of methods of physical coercion that are even more efficient and more pervasive than Orwell imagined. It may be that an "ordinary" member of techno-industrial society does not directly confront this physical force in his daily life. But all members of the system feel this physical strength and vigilance as omnipresent at every moment of their existence. The modern individual is first and foremost surrounded by a wall of distraction, constant stimulation, and brainwashing techniques. If these are not enough to channel his behavior within the desired limits, then there are more concrete methods to incapacitate him.

Technological development consolidated the monopoly of physical violence in the hands of centralized governments and created the enormous capacity for surveillance, control and physical coercion of modern states. Smaller political entities (feudal principalities, chiefdoms, or any other small-scale group that the central organization of society could not control) dissolved into larger centralized political structures, and individuals were left alone and isolated against the leviathans that they almost completely monopolized the violence. This process was almost consummated at the end of the 19th century in the form of hegemony over territories when centralized state organizations instituted their control over most of the world's surface. In continents such as North and South America, Australia and Africa, where there were no or very limited central state authorities until then, the industrial societies established their hegemony at the end of the 19th century. The places where its direct hegemony could not reach then were climatically and geographically unsuitable remote places such as the polar regions, deserts, rain forests, and remote parts of the oceans (as in *Brave New World*). With the technological advances of the 20th century, the intensity of their dominance in the areas they controlled increased. Modern transportation technologies gave them the ability to intervene anywhere in the world very quickly. Advances in communication technologies have made possible the surveillance and control of practically all aspects of the lives of its members and the mass media such as radio, television and the Internet allow the masses to be inculcated with the values and ideas that are necessary.

The destruction of small-scale communities by the centralizing power of technology created the paradoxical isolation of the modern individual. Today, a large number of people live in gigantic metropolises surrounded by large crowds, but in practical terms, they are alone and isolated. The only way for people to come together and actually do meaningful and important activity is to do so through the channels provided by the social system. This means that to do anything practical they must join a large collective in which their contributions carry only minuscule weight, and take on roles that have already been predefined by the system. The friendships they have outside of

this functional group are usually just for entertainment, to pass the time. So they feel alone, isolated and powerless.

Almost every moment in the life of the modern individual is monitored and recorded. Surveillance cameras are practically everywhere; your financial situation, the things you buy, your assets, your education, your skills, your abilities, etc. are in the system databases. The information the system has about its members is increasing even more with advances in computer technology. People have begun to voluntarily submit to the system who constitutes their social circle, what they do in their daily lives, where they go with whom, what they buy, what they see and listen to. Thanks to new computer technologies, such as machine learning algorithms, it is possible to analyze all this vast data to reveal people's desires and fears, that is, their entire character. Thus, the system's brainwashing and physical coercion techniques have increased to a level at least as high as *1984*, if not higher.

A common feature that we see in both *1984* and *Brave New World* is that in both societies the new generations are directly socialized by the social collective from a very early age. Childhood is the period in which people can be socialized (inculcate the values, ideas and behaviors that society considers appropriate for its members) with greater efficiency and success. For this reason, in both novels, submitting the upbringing and education of children to the control of the system from a very early age is very important to implant in people the desired values and ideas. The current techno-industrial society, consciously or unconsciously, demonstrates a trend similar to those of the societies of *1984* and *Brave New World* when it comes to the socialization of children. The destruction of domestic subsistence economies by the Industrial Revolution and the mass exodus from villages to cities caused the breakdown of large family structures and reduced family relationships to the level of the nuclear family. The accelerated and more intense integration of women in the techno-industrial society since the middle of the 20th century caused the relaxation of the ties of the nuclear family and subjected children, from a very early age, to the institutions of the system (kindergartens private or public and other higher education institutions). Apart from these institutions, the other factor that is crucial in the formation of worldviews, ideas and values of the new generations is the mass media (today the Internet above all). Therefore, the family or the circle of close people around it have practically no impact in determining the children's ideas and values. The indoctrination process of the techno-industrial society is reminiscent of the hypnopedia of *Brave New World*. Individuals who from birth have been bombarded through various channels with the values of the system begin to internalize them unconsciously.¹³

The attitude of the current techno-industrial system towards sexuality is similar to that of *Brave New World*. Especially after the advances in contraceptive techniques in

¹³ Some of them internalize these values so intensely that when they try to rebel against the established order they cannot think of anything different and use the values of the system itself to rebel against it. For a more detailed discussion of this topic, see Karaqam, "Solculuk, Tekno-Endüstriyel Sistem ve Vahşi Doga"

the 1960s, traditional conservative attitudes towards sexuality have died out and, in part, the link between sexuality and reproduction has been severed. This has weakened nuclear family relationships, in addition to extended family ties that for the most part had already been severed. As a result, sexuality was partially freed from the responsibility of raising children and thus it became possible to have sex without fear of consequences, solely for pleasure and fun. Therefore, sexuality joined other hedonistic pleasures (consumption, vacations, products of the cultural industry, etc.) that are used to alleviate the discontent that the pressures of the system generate in people.

In 1984, the party forces people to have telescreens in their homes primarily for listening and monitoring, and secondarily for propaganda reasons. In the real world, people have put televisions in their homes on their own. Of course, in the real world the system does not use the television to listen and watch people. Television functions primarily as a propaganda tool. But this propaganda, at least in Western countries, is not as obvious, direct and crude as in 1984. The main function of television in the techno-industrial society is to fill the void and meaninglessness left by the modern lifestyle. The system, because of the lifestyle it implies, makes electronic entertainment a necessity for its members. For the modern individual, being quietly alone with himself and his thoughts is a traumatic experience. That is why he tries to drown out his thoughts with electronic stimuli and by remaining in an artificial universe isolated from reality. He tries to forget for a time the meaninglessness and futility of his existence by hiding it under the bombardment of sound and spectacle of electronic entertainment; Try to feel alive by watching movies, series and other TV shows. Thanks to this, propaganda can penetrate deeper into his psyche and be much more effective, since it acts through a powerful and intense impulse. Since the modern individual spends most of his time under a constant bombardment of intense stimuli that keep his brain constantly busy, his worldview, ideas, and values are formed, for the most part, within the limits of ideology of the techno-industrial system. Because the electronic media (both in its fictional and news forms) propagate, explicitly or implicitly, the opinions and values of the techno-industrial system - apart from certain superficial and inconsequential political differences.

Advances in computer technology have greatly improved electronic entertainment and manipulation techniques. With the exponential increase in the capacity of processors and the speed of Internet connections, the spread of images and sounds became mobile (smart phones) and began to invade all corners of people's lives that were previously impossible to access. attain. Internet media allows to intentionally create addictive states in people: the designs of web pages and applications are deliberately designed to trigger the expectation of new surprises in people (dazzling icons, exciting notifications, etc.) and, more importantly, the induction of the false sense of belonging provided by the pseudo-communities of social networks (the system gives the isolated modern individual a false sense of belonging to an imaginary and unreal community). These techniques create actual physical addictive states in people by activating the

brain's reward system. Thus, people become addicted, in the literal sense of this word, to the entertainment and propaganda of the system.

As we have seen in this article, the ruling classes in *1984* intentionally try to curb the material standard of living in order to preserve the hierarchical structure of society. For this reason, the lower and middle classes of *1984* live in terrible physical conditions. In contrast, *Brave New World* is a society that has a high material standard of living. The development of the techno-industrial system has produced conditions that are, on average, more similar to those of *Brave New World*. And the different nations within the techno-industrial system take as their ideal a society similar to that of *Brave New World*: a society that exploits the "resources" of the planet and enslaves wild Nature to increase the standard of living (that is to say: individuals will have more to buy if they give up their autonomy with respect to the system and live within the limits that are set for them).

In this context, since the end of the 19th century and the beginning of the 20th century, we have witnessed how mechanical technology has diminished the need for physical work; that Fordist mass production has flooded everyday life with numerous commodities; that motor vehicles have connected remote places by accelerating transportation; that living spaces have been increasingly artificialized by concrete structures; and that people are increasingly imprisoned in a virtual world with advances in electronic and computer technology (and this is called communication). The current techno-industrial system uses these advances to keep its members going (those it forces to live in conditions for which they are not evolutionarily adapted, and those it still needs as workers and consumers).

But, of course, this parasitic and hedonistic lifestyle offered by the techno-industrial system is only possible thanks to the relentless exploitation of the Earth's resources. Huge amounts of materials and energy are needed to sustain this lifestyle, and what the system does to procure these is disrupting the life-sustaining functions of the biosphere on Earth. The consumption of a considerable amount of fossil fuels in such a short time, in geological terms, has changed the chemistry of the atmosphere. This has caused climate change and is a disaster for the Wild Nature. Obtaining the minerals needed to produce the basic products of the technologically advanced consumer society is poisoning the land and the water. Plastics, essential components for the products of the techno-industrial system, have penetrated all corners of the biosphere and are displacing the basic components of life. To feed the exponentially increasing population, millions of square kilometers of land have been converted to agricultural land. The destruction of millions of hectares of wild ecosystems to artificially produce plants is causing soil erosion and the depletion of fresh water reserves, and pesticides are destroying insect populations. Armed with the power of modern technology, the fishing industry is literally emptying the oceans of wildlife. Invasive species, which are transported to different geographical areas through the supply chain of the global economy, are destroying wild ecosystems. With this relentless attack on wild Nature, technological civilization is pushing and disrupting the biospheric cycles and may even-

tually lead to a global collapse of the biosphere's functions that support complex life on Earth.¹⁴

The changes that technological development has induced in societies have shown that Huxley was more right than Orwell. Technological development, even if it is not manipulated by a totalitarian bureaucracy and actually creates material prosperity, has been shown to be incompatible with real freedom and human dignity due to its own internal dynamics. But it is not certain that the future social consequences of technological development (in terms of "material prosperity" or the institutional structures of societies) will be similar to those we have witnessed up to now. The system's need to curb those of its activities that go beyond the limits of the biosphere can give rise to a restriction of the permissiveness that it grants to its members in terms of consumption and entertainment. It may have to strictly ration the burden that its members place on the biosphere, and to do so, it would have to intervene in their lives in a much more authoritative way. In addition, the depletion of energy, food and material resources, until now abundant, can generate a deficiency in their ability to distract their members with entertainment and consumption. That could necessitate a more open use of the club that he always has ready and hidden behind his distraction techniques.

Apart from the reactions that the techno-industrial system provokes in Wild Nature, advances in computer technologies can also produce profound changes in the relationships between the techno-industrial system and human beings. The democratic structure (separation of powers, determination of the executive power with universal suffrage, and constitutional rights such as freedom of expression, the right to a fair trial, etc.) and social welfare and security practices (retirement, vacations weekly and annual fees, trade union rights, free health and education services, etc.) became prevalent in Western societies throughout the 19th and 20th centuries, when human labor was essential to the functioning of the system. It was crucial for the system to pay attention to the needs of the masses since it depended on their workforce. The great masses of the working classes who were responsible for keeping the system running were integrated into it through the techniques of democratic management and the practices of the welfare state. Two trends that are occurring due to computer technology (artificial intelligence and robotic technologies) could alter this relationship between the technological system and human beings. First, computer technology is diminishing the need for human labor. A useful analogy to reflect on this trend is Hans Moravec's "landscape of human competition":

¹⁴ The near-term collapse of the technological system is not the greatest danger looming over the future. This disaster scenario that is often repeated in the collapsology literature is, in fact, an optimistic scenario for Wild Nature. The techno-industrial system will seek the solution to its current problems by accelerating the development of technology. New technologies could offer new opportunities for technological civilization to go even beyond the limits of the biosphere. New solutions and energy and material resources not considered or unknown until now will come to light. However, the new resources offered by these new technologies will have to be extracted from the biosphere and will imply a deeper and more intense alteration of its activities.

Computers are universal machines, their potential spreads evenly over an unlimited range of tasks. On the other hand, human capabilities are strong in areas important to survival, but weak in things far from it. Imagine a "landscape of human competition," with lowlands labeled "arithmetic" and "learn things by heart," slopes labeled "theorem proving" and "chess game," and high peaks labeled "locomotion," "hand-eye coordination" and "social interaction". The advancement of computing performance is like water slowly inundating the landscape. Half a century ago it began to choke the lowlands, driving out calculating humans and record clerks, but most of us still stick to dry land. Now the flood has reached the foothills and there our outposts are considering retreat. We still feel safe on our peaks, but at current rates, they too will be submerged in half a century.

The disappearance of the need for human labor due to the advancement of computer and robotic technologies could reduce the sensitivity of the system towards the needs and desires of human beings and could harden its attitude towards them. The management techniques (representative democracy, constitutional rights, etc.) and the practices of the welfare state (retirement pensions, union rights, annual vacations, compensation, etc.) could see their nature transformed towards more authoritarian and ungenerous forms through as human labor becomes increasingly superfluous. There are some indications in the United States that this trend has already begun:¹⁵¹⁶ since the mid-1970s, despite continued growth in labor productivity (which measures the value of output per hour of workers) the remuneration (which is made up of wages and benefits) that the workforce receives for its work remains stagnant; since the mid-1970s, the share of national income that goes to labor (this includes anyone who earns a salary) rather than to capital has been declining; labor force participation has been declining since its peak in 2000 ("the labor force participation rate increased considerably as women entered the labor force, but the percentage of men in the labor force has been in steady decline since 1950, falling from a high of about 86 percent to 70 percent in 2013. The participation rate for women peaked at 60 percent in 2000; the global labor force participation rate peaked at about 67 percent that same year");¹⁷ the US economy is losing its ability to create new jobs; income inequality is rising rapidly; labor market polarization is increasing (labour market polarization is "the propensity of the economy to eliminate strong, middle-skill jobs and replace them with a mix of low-wage service jobs and high-skill professional jobs that, they are generally unattainable for the majority of the working population").¹⁸

Second, computer technology is increasing the system's ability to track people, manipulate them, and control their behavior. The system now has the technical ability

¹⁵ Hans Moravec, "When Will Computer Hardware Reach the Human Brain?" *Journal of Evolution and Technology* (1998), vol. 1.

¹⁶ See "Seven Grim Trends" in Martin Ford, *Rise of the Robots: Technology and the Threat of a Jobless Future*, Basic Books, 2015.

¹⁷ *Ibid.*

¹⁸ *Ibid.*

to track people in their daily lives, record their buying habits, their circle of friends, whether they obey traffic rules, etc. individually, as well as the computational capacity to transform this large amount of data into useful information. Facial recognition and big data analytics technologies based on machine learning algorithms are used to monitor people, discourage harmful behavior and encourage or enforce useful behavioral habits for the social collective. A concrete example of this trend is China's social credit system. With this system, individuals will be rated and categorized based on how they behave with respect to social norms and will be socialized through this digital method of tracking and scoring, apart from the traditional means of propaganda and police methods. Of course, it is not certain that this new ultra-technological method of socialization will be successful and produce the expected results. Overtly forcing people to follow certain patterns of behavior could reduce their faith in and commitment to the social system and lessen their motivation to work voluntarily for its benefit. For all their totalitarian pretensions, twentieth-century socialist societies were less successful than Western capitalist societies in shaping and motivating their members' behaviors. But today's information technology is giving new weapons to the claim of totalitarian control of all aspects of human life and opening the last unreachable corners of daily life to system control. The ability to individually monitor people practically at every moment of their lives could turn out to be a factor that makes it possible for the system to increase pressure on people without giving them permission in other areas (permissiveness in consumption, permissiveness in political opinions and religious, etc). Therefore, the combination of these two trends in computer technologies with the problems of the limits of the biosphere could induce the system to reduce both the bread and the circus that it offers to the masses and, therefore, could evolve to a point more reminiscent of 1984.

Conclusion

Complex human societies, armed with the power of modern technology, have produced an artificial system that forces people to live in conditions totally different from the circumstances in which human beings evolved. It is mandatory to adjust individuals to these unnatural conditions through various methods. In their novels, Huxley and Orwell speculate on how these methods might evolve. Orwell, because he shared the progressive ideology of the Enlightenment and leftism, believed that technological development could produce "beneficial" results. For him, the danger lay in the possibility that a bureaucratic class would divert technological development in order to suppress its supposedly "emancipatory" possibilities and use it to create a totalitarian society. On the other hand, Huxley demonstrated with *Brave New World* the logical results of these "beneficial" consequences. And they would be a complete disaster for human freedom and dignity and for wild Nature.

The transformations that technological development has induced so far in everyday life and in the structures of societies in general, have shown that Huxley's predictions were more accurate. And it is also true that, in its quest to control human behavior, the techno-industrial system combines the methods of *1984* and *Brave New World*. But what is clear is that regardless of its form and whatever techniques it uses to dazzle, control and tame human beings, a technologically advanced society will continue to subjugate/destroy wild Nature and prevent the possibility of true human freedom. The solution is not to achieve a specific form (democratic, liberal, socialist, sustainable, green, egalitarian, etc.) of technological society, but to get rid of it.

Quality of natural interactions

low alienated
Methods used
high
adjusted
Artificial
Domesticated
Results
TDomadTl
wild character
Wild

pace of change
Rapid cultural evolution
Rapid evolution |ex. feral
gradual evolution

Fig. 1. *Scale for the quality of interactions.*

Even within the wild nature there may be variations in the quality of wildness due to specific differences in sparsity and adaptation. There have always been species that are no longer adapted to a specific wild ecosystem and become extinct. That a species becomes extinct is something natural and wild. Somehow, for whatever reason, you fail to complete the wild character pack long enough to find the necessary connections and interactive resources to remain a part of the wild ecosystem.

Another variant within the wildness is the introduced animal,¹ which is internally wild but has reduced wildness because it is not adapted to the external environment. What makes wild animals considered exotic is that they exist in an ecosystem for which they did not evolve, but were introduced through human intervention, voluntary or not (for example, as stowaways). A fox that is wild in Europe is exotic in Australia since it did not arrive there naturally. Its wild character is detrimental to the ecosystem, so while internally it is biologically honest, its external interactions are abrasive

¹ “Feral” in the original. This adjective usually refers to domestic living beings that sometimes are free from human control and return to the wild state in Nature, that is, to feral organisms. However, unusually, here the author with “feral” seems to refer mainly to introduced wild species, also called non-native or exotic, and not so much to feral domestic animals, so in this case it will be translated as “introduced” or “exotic”. *N. from t.*

and harmful to the ecosystem. Alien animals can cause rapid changes and extinctions in their new environment. However, if the animal is left to its own devices, adjustments will occur so that the quality of interactions involving the exotic animal end up adapting to the surviving species and the animal's contribution to what remains of the wild ecosystem improves. The dingo was probably introduced from the Indonesian archipelago as a domestic companion of the aborigines. Back then, it might have been considered exotic. Today, however, it is an integral part of Australia's wild ecosystems. Similarly, organisms that find natural bridges (for example, through changes in sea level or rafts of floating vegetation) to new environments may initially prove as harmful as an introduced animal.

Docile animals constitute another variant of the wild character. Docility refers to the way in which the animal interacts with human beings, whether voluntarily or not. Wahlsten *et al.* (2003) devised a scale for measuring feralness in mice based on difficulty handling them. Some wild animals become tame when tourists offer them food; then their ability to survive in wild ecosystems is reduced and they end up developing artificial dependencies. An unprecedented loss of wildlife due to the domestication of wild areas may now be occurring² (Peterson *et al.*, 2005). A tamed animal crosses the border between the wild and the artificial way of life and its wildness can be trapped and chained by the safety and lure of easily obtained resources.

When we abandon the wild character, we enter the artificial domain of the human. Artificial processes and products are those made and manufactured by man. For some this is a contentious issue and they fall back on the notion that everything is natural, so how could anything be artificial? (Callicott, 1998, pp. 350-351; Vogel, 2003, p. 162). In fact, the artificial is a paradox if it is defined in opposition to the natural. However, there is no paradox if the contrast is made with respect to the wild character. Human beings are not alien to nature, but they lack the wild character, looseness and freedom of the wild animal (Biro, 2005). It is necessary to distinguish between natural processes and wild processes. In *Wikipedia*, *nature* [nature] is defined as everything that exists, from the biotic to the stars through the earth. Wildness and its requirement for interactive quality could be a subset of this "whole," and thus human beings could be natural but not wild. Aplet *et al.* (2000) offers a "wildness *continuum*" in which artificial beings are contrasted with beings that are increasingly wild.

The difference between the artificial processes and the wild character can be seen in their products, due to the difference in the parsimony they present. Humanity has restricted the breadth of influences we are willing to accept, thereby placing limitations on human products and branding them artificial. They have not passed the test of wild character. Things made through wildness have had to abide by the interactions of a host of other organisms and physical environments that mold simple efficiency. Wilderness-influenced things get the natural elegance, the simplicity of function free from frills and fillers and yet durable. Artificial products lack the input of a broader

² "Wilderness areas" in the original. *N. from t.*

set of forces and influences and thus will be more constrained by definition. Human beings cannot perform the acrobatics and actions of a fly but need a large and heavy machine to do the same. We cannot live harmoniously within a land, but we degrade it because we do not know how to live sustainably. The extinction of wildlife represents the failure to be able to live with and adapt to our neighbors and demonstrates our inelegance.

An example of artificial production is domesticated animals. Most domesticated animals were selected by humans between 11,000 and 4,000 years ago (Anderson, 1997; Tixier-Boichard *et al.*, 2011; Vigne, 2011), although the domestication of Wolves probably began around 15,000 BC to 13,000 BC (Vigne, 2011), maybe as early as 29,000 BC (Parker *et al.*, 2010). Life forms that were our companions were dragged into the environment of human activity -or "domus"-, progressively "improved" in human terms, and dispossessed of what was called their "wildness" (Anderson, 1997).

The process of domestication is aimed at reducing wildness and making the organism more manageable for humans. However, even today, some animals still need to be "broken" to take the last step from the natural wild state to human control. "I rejoice that horses and steers have to be tamed in order to make them slaves of men" physical changes that with a reprogramming of the brain that alters the inherited instincts. Domestication normally occurs through selection for juvenile traits, such as finer coats and softer traits, by which the animal remains in a more tolerant or "open" form (Trut, 1999). The "hunting or pursuit instinct" in dogs seems to vary according to the visual range of their eyes and, therefore, according to the degree of stimulation received by the dog (McGreevy *et al.*, 2003) instead of residing in the alteration of "inherited hunting instincts" in the cerebral cortex. However, domestication is an artificial state, and therefore unstable, in animals. Domestic animals such as pigs, 23 horses, rabbits, and cattle often return to the wild, or become feral,³ once human influence wears off (O'Rourke, 2000).

The way in which the wild character acts in those beings that participate in it to produce ecosystems shows some parallels with our own system of interaction with resources and their organization (with which we manage those resources, the economy. The wild character could be considered the system of nature for interaction with resources (not managed, but self-organized), in which the various components build sustainable relationships Neither the economy nor the wilderness are entities that can be observed directly, although they have indices of Prosperity (Gross Domestic Product, Interest Rate, Employment/Species Diversity, Species Populations, Ecosystem Resilience) Only its components can be seen directly, yet both appear robust or even inspiring when those components work effectively together e decided within their respective systems.They combine to give nature It creates a shared theme called

³ "Return to a wild or feral state" in the original. Note that in this case, curiously and in contradiction to what was seen above, the author uses the term "feral" in its conventional sense: "wild". *N. from t.*

wildness and human beings a system called the economy. “When you camp in a wild environment⁴] like this, you are prepared to hear the sounds coming from some of its inhabitants which give voice to its wild character” (Thoreau, 1864). So wildness is a process or system of doing things and it is also the consequent level of organization, ecosystem or cohesion that results from that self-organized system. The economy depends on people’s trust in making it prosper and grow. The wild character depends on the quality of the interaction from and between its components in order to spread through nature and produce wild beings and ecosystems.

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⁴ “Wilderness” in the original. *N. from t.*

⁵ There is a Spanish edition: *Nacida libre*, Capitán Swing, 2019. *N. from t.*

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The countdown

(Book by Alan Weisman)¹

After his book *The world without us* (reviewed on this page), the journalist Alan Weisman returns to the fray with a book that, as the author himself indicates, could well have been called "The world with less of us", although it was finally called *The countdown* and subtitled *Do we have a future on earth?* (Ed. Debate, 2014).

The book is divided into five parts. The first four relate extensively the demographic and ecological situation of various countries through which the author traveled in recent years. Showing some countries on the verge of collapse but also others where a change at the demographic level is already underway or is glimpsed. It is in the fifth and last part where Weisman interviews other ecologists and activists with similar concerns to his and explains what he proposes as a solution to the current ecological crisis.

While in his previous book he did an exercise in fiction showing how wild Nature could regenerate itself without control and interference by human beings. In it, he goes on to study the current demographic situation and the most likely future trends, especially concerned with leaving more space for the rest of the species with which we share the planet, but with the implicit or explicit goal of saving civilization (or what is the same today: save the industrial technological system).

Weisman's proposal is to reduce the world's human population as fast as humane and politically correct methods of birth control allow (global access to contraceptives, improving the level of education of women so that they space pregnancies more, etc. .), so as to curb the growth in the use of certain resources whose excessive scarcity or abundance could trigger fatal environmental changes for civilization. The same author explains it this way:

I would not like a selective trio to take place among those who are alive today. I wish a long and healthy life to all the human beings that currently populate the planet. But either we take control ourselves and humanely reduce our numbers by recruiting fewer new members of the human species to take our place, or nature is going to hand out endless redundancies. When you see survival of the fittest portrayed in National Geographic documentaries, you may find it entertaining. But when it happens to your own kind it's no fun at all.

With Weisman's approach, one can ask multiple questions: Is natural selection in humans really that bad? Aren't we current humans the product of hundreds of thou-

¹ Original title: *The Revenge of Gaia. Why the Earth is fighting back-and how we can still save humanity.*

sands of years of natural selection within wild Nature? And even more worrisome: is there no price to inhibit or “dodge” natural selection for the planet and also for us? of us on the planet, for generating an “artificial” selection that transforms humans as drastically as it has already transformed the environment and human societies?

I am not saying that Weisman is a fraud and hides an anthropocentric desire using Nature as an excuse to save civilization. Moreover, judging by the information I have about him (apart from his books, more can be learned about him in an interview in Spanish that he offered for a Spanish television channel. The link to see it on the Internet is [https://www.youtube.com/watch?v=71e3cFt_KXE]), seems to be a clear fan of wild nature, although tied to certain values of civilization that prevent him from taking his knowledge to other conclusions. I’m simply saying that Weisman is wrong if he thinks that plain human population control is going to benefit wilderness in the long run. If technological development continues (and Weisman himself states in the book that he sees no problem with it), the disruption and destruction of the wild natural world will continue with the same intensity as today, or worse.

An illustrative example reported in the book: Japan now faces a time of population decline (human, of course), while trying to replace the shortage of human labor with robots. But don’t those robots consume energy and resources extracted from the same planet as humans when it comes to being manufactured, maintained and disposed of? Or is it that Weisman thinks that robots, or any other industrial technological monstrosity, unlike humans, are created from nothing and are maintained from thin air? (and all this without taking into account other dangers that technological development creates or aggravates). While explaining how technological development is the cause of exponential human population growth in recent centuries and the underlying ecological degradation, he sees no relationship between continuing technological development (or what amounts to the same thing, maintaining industrial civilization) and the destruction of wild Nature.

The collapse of the current human civilization can lead to a remarkable degree of ecological degradation, but the salvation of this mode of society (the techno-industrial society) would sooner or later mean the domination and total destruction of the world not dominated by humans, that is, the Wild nature. Weisman’s proposal, perhaps motivated by a sincere concern for the current ecological situation, hides that dark side. Those people who feel a true love and devotion for the natural and wild world should take this into account before embracing this type of proposal. I hope this review will help the reader think about it.

TechNo-Fix: Why Technology Won't Save Us or the Environment¹

The truth is that the best thing about this book is its title, literally: "TechNo-Solution: why technology is not going to save us or the environment", since the title of the book promises to explain much more than what the book itself actually accomplishes.

The authors, the Huesemann couple, made up of a "critical" scientific researcher and an academic and social-environmental activist, have produced a book that, by all accounts, appears to be basically a *collage* made up of written pieces independently by one or the other of both spouses, without much subsequent elaboration to try to coordinate and make all the pieces minimally compatible with each other.² Or put another way, the logical coherence of the book as a whole is conspicuous by its absence.

Of course, the fact that the book lacks a logical consistency between all its parts does not prevent it from having a general message that prevails over the other ideas expressed in it and that said message is repeated practically throughout the entire work. The message is: the techno-industrial system must be reformed to make it more "democratic" and less "capitalist". With such a central message, it is clear where the authors are limping and what to expect from this work.

In terms of the ideas expressed in it, the book can basically be divided into two halves: one mediocre and the other bad.

The mediocre half, basically concentrated in most of the sections of the first chapters,³ is the only one that has some usable ideas (seasoned -and with it to a large extent spoiled-, yes, with a multitude of typical leftist and countercultural platitudes) and is more related to what the title of the book suggests. The bad half, concentrated above all in the last chapters,⁴ there is simply nowhere to take it. It is of an unspeakable "left".

¹ Último Reducto book review, *TechNo-Fix: Why Technology Won't Save Us or the Environment*, by Michael and Joyce Huesemann, New Society Publishers, 2011 .

² The sheer number of blatant contradictions throughout the book, along with other basic logical flaws, make one unable to help but doubt either the actual intellectual capacity of the authors or whether both members of the Huesemann couple really share their ideas and values about technology and its development (something recommended when writing and signing a book completely halfway, because both present themselves as co-authors; it is not that some chapters or parts are explicitly signed one of the spouses and the rest the other).

³ Specifically, Part I, chapters 1, 2, 3, 4 and 5 and Part II, chapters 7, 8 and 9.

⁴ Part I, Chapter 6, Part II, Chapters 10 and 11, and Part III, Chapters 12, 13, and 14.

Let's see first what ideas are salvageable among all that progressive ideological rubbish:

- The idea that **the development of technology always has inherently unpredictable and inevitable consequences** (explained, not always fortunately enough, in chapters 1 and 2).

- The idea that **technological development inevitably implies domination of Nature and people** (developed equally clumsily in chapter 3).

- The idea that **technological solutions do not work and**, as indicated in the two previous points, **usually aggravate existing problems and generate new ones** (idea developed in the chapters 4 - dedicated to "counter-technologies" or technologies developed to combat the effects of previous technologies- and 5 - dedicated to the negative effects of improvements in technological efficiency or "rebound effects"-).

- **Criticism of the idea of progress and techno-optimism** (fairly poorly presented and argued in chapters 7, 8 and 9).

Well, here comes the relatively usable part of the book, in the rest of the chapters (and also in a good part of those mentioned), the authors completely forget these basic ideas related to technology and its development and propose, one after the other, another, ideas, solutions and suggestions intrinsically contradictory with them, mixed with the typical and inevitable "anti-dogmatic" dogmas, pseudo-critical nonsense and ideologically induced unrealistic illusions.

The detailed treatment one by one of all the book's defects and errors, of which at least one example appears on almost every one of its pages,⁵ would make it possible to write another book at least as long. Therefore, only the main ones will be discussed below, mentioning only a few illustrative examples:

- **Leftist and countercultural topics.** As it could not be less, given the fur of its authors, the book is full from beginning to end of references to the typical commonplaces of progressive and hippy rhetoric: rejection of "materialism",⁶ of individualism,⁷ of competitiveness,⁸ of mechanism,⁹ of determinism,¹⁰ of capitalism,¹¹ of alienation,^{12,13} exploitation,¹⁴ etc. and defense of democracy,¹⁵ of subjectivism,¹⁶

⁵ Although the book is 435 pages long, the meat of the book (which is what I mean) is 369 pages long, the rest being basically a preface by Paul R. Erlich and Anne H. Erlich (in the same ideological line as the rest of the book, by the way), notes and bibliographical references and an index of terms.

⁶ For example, pages 111, 222 and 293.

⁷ For example, pages 228 and 293.

⁸ For example, pages 228 and 318.

⁹ For example, pages 12, 35, 286 and 316.

¹⁰ Page 13.

¹¹ For example, pages 150, 158, 179, 250 and 257.

¹² For example, pages 31, 76, 220, 231 and 232.

¹³ For example, pages 31, 76, 220, 231 and 232.

¹⁴ For example, pages 49, 52, 54 and 55.

¹⁵ For example, pages 224-225, 286 and 306-309.

¹⁶ For example, pages 114-115 and 274.

of what is socially appropriate,¹⁷ of sustainability,¹⁸ of love and empathy,¹⁹ equity,²⁰ distributive justice,²¹ cooperation and sharing,²² social negotiation and consensus,²³ charity,²⁴ community welfare,²⁵ multiculturalism,²⁶ non-violence,²⁷ paradigm shift,²⁸ of quantum indeterminism (beyond subatomic physics),²⁹ of the spiritual,³⁰ of moral and historical progress,³¹ of development,³² of happiness,³³ etc.

Without going into details, it should be noted that the abundant references to such leftist and countercultural topics and values throughout the book are a begging question (or principles in this case). Anyone who does not share the authors' enthusiasm for such values and slogans will easily see that much of the book is largely devoid of any intellectual sustenance beyond antagonistic political correctness.

Only two of the most notable examples will be briefly discussed below:

One of the many countercultural jingles that the authors repeat throughout the book is that "Everything is connected to everything"³⁴ and therefore, according to them, (1) there is really no separation or difference between subject and object or between the human and the natural³⁵ and (2) any action on a specific aspect of reality will have serious repercussions on the rest of the elements that constitute it. Corollary (1) is a fallacy that involves confusing "having a relationship with" with "being the

¹⁷ As is always the case with the rest of anti-capitalist leftists, the authors, on the one hand, criticize current society for being "capitalist", "exploitative", "anti-democratic", etc. and they consider themselves rebels (or even revolutionaries) who believe they are going against the current, that is, against said society and its social norms but, on the other hand, for them society and the social are values and goals in themselves, that is to say the good, so that in his discourse society and the social remain without really being questioned. Thus, they often defend as a condition for considering a goal defensible that it be positive for society (that is, for the current techno-industrial society) and improve its functioning and sustainability and/or imply a better social integration of individuals so that they can "contribute positively and effectively to society". (For example, pages 68, 223, 225, 227, 229, or 285).

¹⁸ For example, pages 122-125, 280 or 295-300

¹⁹ For example, pages 114 and 290.

²⁰ For example, pages 140 and 187-188.

²¹ For example, pages 187-188, 233.

²² For example, pages 115, 318.

²³ For example, pages 77, 86 and 115.

²⁴ For example, pages 293 or 323. On this last page, the authors in the midst of an outbreak of good-natured ecstasy go so far as to affirm that there can be no excess of charity. They obviously don't know the famous Spanish saying: "Plague enters through charity".

²⁵ For example, pages 259 and 286.

²⁶ For example, page 293.

²⁷ For example, page 237.

²⁸ For example, pages 273-277, 285, 287, 289, 295 and 320.

²⁹ For example, page 13.

³⁰ For example, pages 181, 219, 220, 221, 223, 284, 292 and 293.

³¹ For example, page 172.

³² For example, pages 282-284.

³³ Chapter 9.

³⁴ For example, pages 4, 49, 70 and 73.

³⁵ For example, pages 4 or 277.

same as", "being indistinguishable from", "depending on" or "being part of" (apart from other serious practical consequences very different from those that its defenders usually believe).³⁶ Corollary (2) is illegitimately extracted from the recognition of the mere fact that reality is complex. The fact that things are often more complex than they seem and that this complexity (basically consisting of interactions between the elements and factors that make up real systems and processes) and its implications (for example, unforeseen effects and feedbacks) with excessive frequency are not taken sufficiently into account when describing, assessing and acting on real phenomena and systems, it is one thing that everything is related to everything (in the same way and to the same degree, without nuances). of any kind) and that every action has serious effects on the whole of reality, a very different one that cannot be logically inferred from the first. Perhaps it is true that everything is related to everything but, of course, not everything is related to everything else in the same way and with the same intensity, so that in practice many actions applied to certain aspects of reality do not affect appreciable to many other elements of it. Moreover, by avoiding nuances and putting all human actions in the same bag, the mystical and supposedly holistic motto of yore does not add anything practical to the problem of the impossibility of predicting and avoiding the unforeseeable negative effects of said actions, unless that it be interpreted as an invitation to stay completely still and let ourselves die.

Following that same clumsy line of "reasoning", the authors affirm that the reductionism and mechanism supposedly prevailing in modern science when it comes to analyzing and interpreting reality are incapable of providing a real and complete knowledge of reality and, consequently, of accurately predicting the phenomena that constitute it,³⁷ thus implying that if these attitudes were abandoned and replaced by other more "holistic" and democratic alternative approaches to doing "science", this would allow achieve a complete knowledge and an accurate prediction of the real phenomena (and

³⁶ This nebulous anti-dualist monism that in principle a large part of environmentalism assumes and defends in a foolish and incautious way as an indispensable part of its theory (human-Nature unity; the human as an integral part of the natural world) basically implies that things like the techno-industrial system would be as natural as the ecosystems and wild processes that it destroys and subjugates, and that therefore said destruction and subjugation would be morally comparable to any other behavior of any other species, that is, neutral (or even positive) . By self-satisfiedly advocating becoming "one with Nature," these panolis are inadvertently doing nothing more than justifying and promoting the destruction and subjugation of Nature.

³⁷ For example: "[I]nevitable negative consequences are inherently unpredictable because reductionist science cannot provide the necessary information about all possible interactions and cause-effect relationships within complex systems" (page 73). By the way, regardless of what actually causes the unpredictability of the consequences of technological development, it should be noted that to say that they are *inevitable* and *intrinsically* unpredictable is in itself contradictory and impossible to marry logically with saying that its unpredictability and inevitability occur because of the supposed reductionism of science. Either they are inevitable and intrinsically unpredictable (that is, they are inherently so, always and regardless of circumstances) or they occur and cannot be predicted only sometimes (when, according to the authors, science is "reductionist", for example) . Other examples: pages 11-12, 78 and 181, 237-238, 304.

the consequent effective control of the same). However, the authors overlook that in other parts of the book they themselves acknowledge the fact that the complexity of real phenomena is such that it is simply *physically* impossible to know and understand all the elements and factors involved. they constitute and influence them.³⁸ Therefore, no matter how alternative, democratic, holistic, spiritual or critical the “science” that is tried to be used to predict (and control) real phenomena is intended to be, it will be equally impossible to achieve it exactly and completely.

- **False criticism of modern technology.** In the end, if one gets something clear from reading the book, it is that, despite what the title might lead one to believe, the book is actually *does not question modern technology and its development at all*. The problem, according to them, is not technological development itself, but rather that it is directed by anti-democratic, authoritarian and capitalist elites that promote and maintain wrong worldviews and values in society as a whole. And therefore, according to them, the solution is to replace these elites with “democratic” and “community” control (whatever all this *chachipiruli* refrain means) and change the ideas and values of the people.³⁹

Despite the fact that in certain parts of the book the authors acknowledge that technological development always has unforeseeable negative consequences and that it inevitably entails the domination of Nature and human beings, they paradoxically defend that technological determinism and the autonomy of technology are a myth⁴⁰ and that the development of the techno-industrial system is merely the fruit of certain wills and mistaken ideas, promoted by certain powerful elites. That is to say, that for the authors and their co-religionists red and “green” what makes pollution, the destruction of ecosystems and the subjection of people to increasingly artificial environments and increasingly subtly restrictive social norms that inevitably entails the maintenance and development of an industrial society are something bad, it is merely or mainly that they are, according to them, the product of a capitalist, individualist, and anti-democratic management. Because it seems that, for them, if the techno-industrial society were managed (more) democratically and in a community and participatory manner, either it would stop producing said negative impacts or they would stop being negative and would become neutral or even positive. What they do not make clear is how democracy and participation actually and physically cause *inherently* unpredictable and/or unavoidable negative effects to cease to occur, or even magically become “beneficial”. How will the democratic and community management of the techno-industrial system ensure that, for example, it does not need to destroy Nature to obtain raw materials, energy and space to maintain and grow? How will it achieve that a level of techno-

³⁸ Like, for example, when they talk about the unpredictable consequences of the development of technology in chapters 1 and 2.

³⁹ For example, on pages 237-238, 240-245, 247-248, 284-286, 291, 301 and 306-309.

⁴⁰ Pages 241-245.

logical development equal to or even greater than the current one⁴¹ ceases to imply restrictions for the autonomy of Nature (including natural human behavior)? They don't say it; simply, as good leftists that they are, they believe it and adapt the interpretation of reality to their ideology, projecting it in the form of illusions. For them, as for all their co-religionists who mix social justice with ecology, democracy is stronger than physical laws.

Thus, according to them, the main cause of the problems that the current technological system poses for human beings has nothing to do with the inevitable lack of individual freedom that it entails, but just the opposite, said main cause, according to them, would be the assumptions of individualism and competition (including violence),⁴² as well as the lack of social integration, community awareness and empathy that supposedly characterize human life within said system.⁴³ The fact that individuals in this system are forced to collaborate, identify and live with strangers in crowds of thousands or millions of people; that they are completely dependent on participating in the technological society to satisfy all their basic needs and that for this they have to submit to increasingly subtle, deep and strict regulations and restrictions on their behavior; and the fact that they are coerced by their social environment in increasingly sophisticated and effective ways, all for the "common good", for the "good of society", is a fact that, like the vast majority of anti-individualist collectivists who swarm and thrive in modern society, it eludes them (or they prefer to ignore it). His unwarranted assertion that technological determinism and autonomy are a myth (at no point do the authors explain why these are not real according to them; they simply deny their existence) is actually one more begging of the question, since without it their theory about democratic, socially just, anti-capitalist and communitarian control of technological and social development would collapse.

Another proof that the authors are not really critical of modern technology is their defense of the concept of "appropriate technologies".⁴⁴ And with this expression they do not mean non-industrial and small-scale technologies, with a relatively low inherent ecological or social impact and that can be created and used completely independently by small social groups, but rather industrial and large-scale technologies completely dependent on of an enormously large and complex social and technological system, but supposedly "green", that is, clean, *without* ecological or social impacts *of any kind*.⁴⁵ The latter is impossible to achieve in practice, since both industrial technology and the absence of serious impacts are inherently incompatible. It is mere physics. There are always and will be impacts: waste, the alteration of ecosystems, the occupation of natural spaces, the alteration of non-artificial processes, the interference in human

⁴¹ Because the authors at no time intend to reduce said level of development, but even defend that it would increase with such democratic and participatory management (for example: pages 282-284).

⁴² For example, pages 313 and 320.

⁴³ For example, page 114.

⁴⁴ For example, pages 286 and 295-311.

⁴⁵ Or at most supposedly priceless. For example, pages 130, 238, 296

evolution and in natural human behavior, etc. they are unavoidable material consequences of all technology manufactured and used by human beings, and they are more intense the more advanced and modern (ie, more complex and larger in scale⁴⁶) that technology is. In the case of very complex and large-scale technology such as industrial technology, the destruction and subjugation of wild Nature and the interference in the autonomous expression of human nature are enormous and inescapable, simply because, respectively, the larger scale and complexity of such technology require the use of more energy, resources and space as social conditions need to be more strictly controlled for such technology to function properly. And as the authors themselves should know, this problem has no (techno-)solution. Technological attempts to solve it (that is, to reduce the impacts of pre-existing technology), no matter how "green" and "clean" they are called, always generate new impacts in turn, when they do not aggravate existing ones.⁴⁷

- **Lack of realism and intellectual honesty.** Given the above, it is not surprising that in chapter 14 they go one step further and present us with what they and some of their closest co-religionists call "critical science",⁴⁸ which basically is nothing more than thinking: "science is what suits me and I feel like it, depending on the case". Thus, with regard to science in general, they point out that, according to them, it is always, completely and irremediably a social construction that is falsely neutral and objective, ideologically biased, loaded with values, "reductionist" and "mechanistic", and ultimately fallacious and unscientific.⁴⁹ But, at the same time, when it comes to promoting their own supposedly scientific theories ('critical science'), they assure us that they are 'holistic', 'social', 'democratic', truthful, etc. They were? If, according to them, science can never be objective or reach the truth,⁵⁰ why should the conclusions of "critical science" be an exception? If, according to them, science is always value-laden and ideologically biased, wouldn't a science that claims to present itself from the outset as "social" and "democratic" be by definition just as value-laden and biased, or even more so? Or is it rather that the problem, for the authors, is not the ideological bias and the lack of objectivity that this entails, but merely the sign of said bias (it is good if it is based on its own values and ideology, bad if it is based on those of its "enemies") even if it causes the same degree of distortion (or more) when describing and interpreting reality? In fact, what the authors present to us as "critical science" should actually be more honestly called "leftist pseudoscience."

⁴⁶ Understanding by "scale" not the size of the specific devices themselves, but the extension and physical scope of the technological system of which they are a part.

⁴⁷ And in fact, the authors contradict themselves for the umpteenth time when, on page 140, they state as a goal only to *reduce* the impacts (which, at least on this page, they seem to consider to be exclusively resource depletion and pollution) through technological innovation.

⁴⁸ For example, page 320.

⁴⁹ For example, pages 316-319.

⁵⁰ For example, page 313.

The authors, in reality, with all that "critical science" nonsense, all they do is dishonestly try to heal themselves, to theoretically justify or conceal their intellectual incompetence, making use of the postmodern and countercultural relativist and irrationalist arsenal (that is, the hackneyed theories about the supposed impossibility of achieving objectivity or knowledge of the truth, the social construction of science, the supposedly pernicious nature of reason, etc.). Thus, in the end, the contradictions, fallacies and logical inconsistencies, the lack of rigor, the anti-empirical premises, the anti-dogmatic and politically correct dogmas, etc. of his speech they go from being obvious defects to being supposed virtues in the excessively elastic and diffuse, but clearly biased, theoretical framework of "critical science".⁵¹

Once his discourse has been shielded in this way from "rationalist" criticism, the least important thing is the rigor and accuracy of the data on which it is based. Thus, authors can make all kinds of claims without even explaining what they are based on. It is enough for them to say: "it is proven that" (or something similar)⁵² without further references or data,⁵³ before spouting things like that it is possible to achieve a sustainable modern society and appropriate" or renewable energies *without* impacts,⁵⁴ that pre-industrial societies had zero population growth⁵⁵] and were sustainable,⁵⁶ that hunter-gatherer societies were virtually free of microbial infections,⁵⁷ etc.⁵⁸

And similarly, the facts are overlooked by authors, or even manipulated or made up, whenever reality threatens to shatter their illusions and expectations. One of the most striking examples of this would be when they state that the efficacy of modern medicine has not been proven and that, in most cases where it appears to be effective, it really is not because its techniques, treatments and interventions really are, but merely because of the placebo effect.⁵⁹ It seems that, according to the authors, antibiotics, vaccines,

⁵¹ It is not that rational doubts cannot be raised about the intrinsic limits of objectivity, veracity and rationality of the scientific method (and especially about how scientists interpret and apply science). On the contrary, some such limits exist. However, the exaggerations of the authors (and their postmodern and leftist ideological referents) in this regard, embracing *at their convenience* subjectivism, relativism and irrationality, do a disservice to the correct understanding and acceptance of those reasonable criticisms about the limits of science and have nothing to do with them, but rather with the intellectual dishonesty, psychological fragility and moral laxity of the authors.

⁵² For example, pages 310 and 311.

⁵³ Unless, at best, more than questionable references to (or perhaps even misinterpretations of) the speculations and fallacies of his famous co-religionists (Alan Drengson, Theodore Roszak, Herman Daly, EF Schumacher., Marshall Sahlins, Jerry Mander, etc.).

⁵⁴ For example, pages 296 and 298-299.

⁵⁵ For example, page 117.

⁵⁶ For example, pages 50, 117, 261, 279 and 310.

⁵⁷ For example, page 86.

⁵⁸ For example, pages 117 (on solar energy as the alleged sole source of energy for prehistoric and pre-industrial agriculture in general), 157-159 (on supposedly comfortable life in pre-industrial societies) or 303-304 (list of utopian claptrap about what "appropriate" modern technology would look like if the authors' "wise" recommendations were followed).

⁵⁹ For example, pages 160, 162-165 and 194-200.

surgical interventions, etc. they don't really work *ever*. If you have an infection, it is not caused by the antibiotic you are taking, but by the placebo effect, that is, the belief that the antibiotic will cure you (the authors seem to be suggesting that it would be just as well if you took a piece of candy as long as you tell you it's a medicine and you believe it). If you have appendicitis or a cavity, it is not the removal of the infected appendix or the filling of the decayed tooth that cures it, but the belief that such intervention will cure you (the authors seem to imply that it would not matter if the surgeon or dentist did so). fuss pretending to intervene without actually touching even a hair). And so with any other physical treatment of modern medicine that the reader can think of. Here, the authors, displaying typical countercultural idealist incontinence, take the critique of modern medicine to unsuspected anti-materialist extremes.⁶⁰

- **Sloppy interpretations of technology.** A tremendously widespread error in this society and from which the authors (and even some much more serious and respectable critics of technology than them) are also not free, is the confusion between the concepts of science and technology.⁶¹ Science is just a method to obtain data about reality in order to describe it as faithfully as possible. Technology is the material tools that are used to interact with and manipulate reality (and, by extension, the system formed by the set of said tools and the interactions between them). Certainly, much of the work of scientists today is directed at developing technology, that is, at developing practical applications of knowledge gained through the scientific method, and in turn much of the work of obtaining that knowledge is done through to the application of modern technologies. That is, today, most science is technoscience or engineering. But although much of science is currently closely linked to technological development, deep down science and technology are still not the same and confusing them or using both terms interchangeably as if they were is a serious basic error of appreciation. If we intend to criticize technology and are not even capable of differentiating it from science, we are off to a bad start.

⁶⁰ Again, it is not that modern medicine cannot be rationally criticized on many counts, beginning with its inevitable relationship of dependence on and encouragement of modern technology (along with its inevitable negative consequences); its abundant iatrogenic effects (health problems caused by the medical treatments themselves); its often palliative nature that often avoids focusing attention and acting on the prevention and correction of the true causes of diseases; its pernicious effects on individual natural selection; its enhancement of population growth by reducing the death rate; etc. But to force this criticism to the irrational extremes that are observed in the book, denying the evident immediate practical efficacy of certain medical therapies and techniques when it comes to repairing, alleviating or even preventing certain health problems would be to deny reality simply because it seems to us ideologically inconvenient. Things like antibiotics, surgery or vaccines are largely effective in restoring health or preventing disease in the human population in the short term, even though they may also have secondary effects on one's own health. and negative consequences in other aspects in the longer term and on a larger scale, and however much, when evaluating modern medicine, some of these non-immediate negative effects seem to some of us to outweigh their immediate practical advantages. Denying an opponent's strengths doesn't make them more easily beaten, it just makes the one who denies them weaker.

⁶¹ For example, page 285.

Another typical error of many critics of technology and which the authors also echo in the book is to focus the criticism of the myth of the neutrality of technology⁶²] in idealistic arguments of the type: all technology is always the product of certain values and incorporates them.⁶³ In reality, the development of technology, like that of any other aspect of human societies, depends much less on ideologies, values, beliefs, etc. (that is, the superstructure) of said societies than of material and objective factors such as the need and availability of matter, energy and space, the birth and death rate, the climate, the surrounding ecosystems, the competition with other social groups for the territory or resources, etc. (ie the infrastructure). The technology of a society reflects much more the material factors that condition the maintenance and development of said society than the values of the same (or of some of its members), which, by the way, are anyway, in the last instance, product of the infrastructure in turn. So if we focus our critique of the neutrality of technology on the inevitability of certain values supposedly associated with it, we are following a really loose line of idealistic and relationship-based reasoning. In fact, we will be diverting attention towards values and ideas, instead of towards technology itself, ironically giving the defenders of the myth the reason (that is, we would be insinuating that the values that supposedly inspire it would be bad, but not the technology itself).⁶⁴ It is therefore not surprising that the myth of the neutrality of technology continues to be alive and well despite the fact that many renowned critics of technology have spent decades trying to combat it, referring mainly to the supposedly inevitable causal relationship between values and ideologies. of certain individuals, groups or societies and the technology they produce and use. A much more obvious, robust, accurate, understandable, concrete and invulnerable way to attack this myth is to focus on pointing out and explaining the negative *material* effects of technology that are inherent in it and explaining what mechanisms, physical laws and material conditions make such negative effects unavoidable. But of course, for this, those who apply it will first have to go down to earth and get rid of the idealistic veil, typical of a large part of the social sciences and humanities (including, of course, all the leftist and countercultural rubbish), which clouds their vision.[1454]

In short, if the would-be critics of technology themselves are unable to properly define, identify, delimit, interpret, locate, and evaluate it, turn off and go.

⁶² This myth consists of the idea that technology is morally neutral and that its moral character depends exclusively on who creates/uses it, how they create/use it, and what they create/use it for.

⁶³ For example, pages 235-236, 237, 240 or 313-320.

⁶⁴ And indeed, when the authors and other supposed idealistic and voluntarist critics of the neutrality of technology state that the fundamental problem is that technological development is directed by capitalist and anti-democratic elites and suggest as a solution (more) democracy and popular participation in decisions about the course and orientation of said development and/or changing certain values that are presumably currently prevailing in the techno-industrial society, are contradicting their own affirmation that technology and its development are not neutral. If these media are not neutral, the problem is intrinsic to them and will not change by changing the agents that apply them or their values.

- **Social fixes.** The authors, as good parishioners of the leftist church, defend the application of solutions largely based on social engineering, that is, on changing and controlling society by changing people, their behaviors, their social relations, the structures and institutions derived from them, etc. through the reeducation of the population so that they adopt the “new” values, ideas and behaviors that they consider good.⁶⁵ That is, through propaganda, indoctrination, oversocialization, political correctness and social pressure. This approach, already problematic in itself due to its inherent liberticidal nature, that is, contrary to the autonomous expression of human nature, is especially shocking and makes water everywhere in the case of authors who consider themselves against the oppression of the modern industrial system and critical of techno-solutions (including what they call “counter-technologies” -defined above-). The authors not only overlook their own statements about the impossibility of predicting and controlling reality (they seem to forget that social systems are also part of that extremely complex and practically uncontrollable reality) or their apparent rejection of what they call “social fixes”⁶⁶, but rather the values, ideas and (techno-)solutions themselves (although these are camouflaged under euphemistic names such as “appropriate technologies” or “clean technologies”) supposedly The liberators that they propose are actually part of the problem, since, as recent history has shown and continues to show, they do not address the true cause of the problem and even aggravate it. Anti-capitalism, the democratization of technology, “green” technologies, social justice, etc. they are not going to save us from the problems inherent in the techno-industrial society, because those problems derive from, or at least are aggravated by, modern technology itself, not by who manages and uses said technology, or by how they do it.

Moreover, the authors’ leftist social engineering completely fails to take into account a primary factor when trying to influence the course of development of a social system: the limits of human nature. This nature, like non-human Nature, imposes limits on the form, functioning and structure that a social system can take, by limiting the forms that human behavior can adopt. If only for this reason, it is not possible to create or shape any type of company at the whim of its managers. They must always have these natural human limitations. And therefore, the propaganda and repressive apparatus that allows human behavior to be shaped to a certain extent, is in turn subject to certain limitations due to this. Thus, even to get the population to adopt those behaviors that are possible but not natural, constant pressure is required. At the moment that the propaganda and repressive pressure relaxes, human nature returns to its ease and the structure of the social system planned by the managers collapses. This condemns any attempt at social engineering that claims to be minimally efficient to perpetual dependence on a strong propaganda and repressive apparatus, which

⁶⁵ For example, page 76.

⁶⁶ According to them, “social fixes” are techno-solutions (counter-technologies, more specifically) applied to solving social problems caused by technology itself (pages 75-77). By the way, it is worth asking: Does the use of the enormous technological apparatus

currently will imply perpetual dependence on a technologically highly advanced social system and all that this entails. The left-wing techno-industrial society that the authors dream of achieving would not be as good and beautiful as they believe and want us to believe, because it would not arise spontaneously and by chance simply by eliminating capitalism and “democratizing” technology. Either they impose their “new” version of the “green”, progressive and *chupiguay* techno-industrial system through force and/or deception or they will fail and everything will stay the same. Although, to tell the truth, judging by the values and goals defended by the authors, it is very likely that great differences would not be noticeable in either case in terms of individual human freedom and the autonomy of Wild Nature: they would be equally damaged. .

And so we could continue this review commenting on one nonsense after another for pages and pages, but with what has already been said it is more than enough to get an idea of what the book is like and where the shots are going.

Ultimately, the shortcomings of this book far outweigh its strengths and mean that on the whole, if one really wants the destruction of the techno-industrial system to free wild Nature (including human nature) from technological slavery, its propagandistic and repressive necessary to try to apply that do-gooder social control that they propose wouldn't it in turn be a technofix like the top of a pine tree, with all the inconveniences that this entails? Wouldn't using it, supposedly to combat and prevent the problems caused by modern technology, make it a counter-technology in turn? reading is not really worth it. Except as a means to get to know certain enemies better, who at first glance may seem like allies.

Virtues of the ethics of respect for the autonomy of nature

Therefore, unlike a pure preservationist ethic of non-interference, respect for the autonomy of nature in relation to humanity offers us some guidance on how to deal with the mixed or rural landscape. The only guidance that pure preservationists offer about how we treat the nature we use is to minimize our involvement with it (or use it as efficiently as possible). As Eric Katz puts it, “Even in the case of hybrid environments, we should be inclined to leave nature alone” (Katz 2005). However, then our advice to the traditional farmer, logger and rural builder is “do as little farming, logging or housing as possible”. If respect for nature means leaving nature alone, then using nature means disrespecting it, and at best we can only minimize our disrespect by using it as little as possible. On the contrary, if respect for nature can mean respecting its autonomy in relation to humanity, then it is possible to use nature and respect it at the same time. The use of nature that does not compromise its autonomy may be a respectful use.

A pure preservation ethic not only offers no real guidance on how to treat nature that is not completely wild, but also tends to underestimate the value of this type of nature. Disrespect for nature that is not fully wild is increasingly the target of critics of the ethics of wilderness preservation. Val Plumwood puts the critique this way: “A dualistic wilderness cult that confines respect and status of ‘nature’ to pure wilderness does not advocate a culture of respect for ordinary land or for nature in general. the context of everyday life” (Plumwood 1998:667-668). By making respect for the autonomy of nature in relation to humanity central to an environmental ethic, we can avoid viewing non-wild lands[or] and human-influenced species as inferior, as degraded versions of wild nature. Rural lands and domesticated animals and plants - although much more influenced by humans - can be as autonomous as wild nature. We can respect them by influencing them in a way that doesn’t dominate them and allowing them to influence our lives in turn.

A purely preservationist ethic tends to consider wild nature or wild lands[p], entities or places devoid of a high degree of human influence, as nature par excellence. Once natural entities have been significantly influenced by humans, they lose their nature or natural status. Thus, for Rolston, an improved nature is no longer authentic nature, and for Katz and Keekok Lee (1999), biotas that have been significantly influenced by humans are artifacts, whether they are restored landscapes or domesticated animals or plants. . However, it is not convincing to say that a lake that was previously devoid

of fish is no longer nature if humans introduce fish into it, nor is it credible to say that replanted forests, horses, or cattle are unnatural, that they are artifacts. created by human beings, as artificial as plastic chairs. Granted, these entities are not wilderness, but unless wilderness is the criteria used to define nature, things can be nature and natural without being wilderness.

The concept of the autonomy of nature in relation to humanity can also help us in this case. We can affirm that the human influence on landscapes and other natural entities does not necessarily make them unnatural and artificial beings, as long as they maintain their autonomy in relation to humanity. According to this perspective, some rural landscapes and some domesticated animals and plants can still be considered nature and natural, even when significantly influenced by humans. Only when his relationship with humanity is such that his autonomy has been undermined will he be [or] “Nonwilderness lands” in the original. *N. del t.* [p] “Wilderness” in the original. *N. from the t.* reasonable to affirm that they are no longer natural beings but rather artificial beings that belong to the category of culture rather than to that of nature.

An example of the excesses of defining nature as wild nature is Keekok Lee’s statement that “transgenic organisms are artifacts with a degree of artificiality analogous to that of plastic toys” (1999:53). Inserting a few genes into an organism with tens of thousands of genes hardly makes it a human-made artifact, analogous to a cultural phenomenon like a hula-hoop. Similarly, a replanted forest, even a vegetable garden, retains enough autonomy from humanity to be considered nature. Sun, rain, birds, bugs and all manner of natural processes continue to operate beyond human control in orchards and forest plantations, making a compelling claim to autonomy from humanity. An aquarium or bonsai garden, on the other hand, may be sufficiently under human control and artificial enough that the label “nature” can be convincingly removed. By defining nature not as the absence of human beings or human influence, but as something that requires the absence of human control and domination and the presence of autonomy in relation to humanity, we allow human beings to have a place and a role. In nature. Human beings can use nature and natural entities without necessarily destroying their essential character. Our use of nature can be respectful of it, as long as it retains its autonomy in the context of that use. The strict separation of humans and nature (ie human/nature apartheid) need not be our only way of respecting nature. Human participation in nature and the human relationship with natural entities, both limited by respect for their autonomy, are equally important components of an ethic of respect for nature.

Conclusion

Although preservationist insights and policies are of crucial importance for proper respect for nature, by themselves they offer a merely negative model of humanity’s relationship with nature. By supplementing preservationism with an ethic of respect

for the autonomy of nature in relation to humanity, we enable human beings to play a positive role in nature. With respect for the autonomy of nature as a central moral norm for the human relationship with nature, human involvement in nature does not necessarily have to be harmful or degrading to nature in regards to this important trait. This opens the door for human respectful use of nature and human prosperity in nature to be real possibilities.

GRADES

1. In addition to the examples mentioned in the text, see Robert Elliott (1997), Ned Hettinger and Bill Throop (1999), and Keekok Lee (1999).

2. Taylor explicitly accepts that some interference is compatible with respect for nature (1986: 94). However, most of his examples involve human beings undoing the damage they have caused, and this is not an entirely positive involvement in nature. It also gives examples of veterinary assistance to wild animals and providing food and shelter to birds. However, while these examples could be viewed as consistent with Taylor's fundamental non-interference obligation, they are not examples of respectful use of nature.

3. Callicott (1991) is right about the importance of imagining such a notion, which he calls "sustainable development." Unlike Callicott, I believe that such a relationship should go hand in hand with an ethic of wilderness preservation[q] and not necessarily replace it.

4. For a discussion of these notions, see Rolston (1988:197-201; 1994:181-184) and Lee (1999:177-180).

5. Of course, mutual domination is possible. However, the high degree of influence of one party over the other that would be considered dominance in the absence of a corresponding influence to the contrary would not necessarily be a situation of mutual domination if the corresponding influence were present.

6. It is true that when a person hikes or camps in wilderness[r], nature has a great influence on that individual and the individual has little or no influence in the wilderness[1462][1463]. However, such influence is temporary. It is a kind of holiday influence, much less powerful and less prolonged than the influence that rural nature has on the lives of rural people who live with and thanks to nature.

7. I am grateful to Bill Throop for this particular insight and discussion, which was extremely helpful in the genesis of this essay.

8. Examples where people are vulnerable to nature and have little choice about it - lightning strikes, tornadoes, the inevitability of death, etc. - offer particularly powerful evidence for the idea that nature it is not completely dominated by humans. In this respect, it could even be considered that nature dominates human beings and impedes our autonomy. See Katz (1997:133-146) for a discussion of this.

9. Michael Gill has provided a troubling counterexample to the suggestion in this section. “If making ourselves more vulnerable to nature is a step toward respecting the autonomy of nature in relation to humanity, human-caused global warming—a dramatic human-caused alteration of nature as never before there has been another - should be considered as a step in the direction of respecting the autonomy of nature, since global warming could well make us more vulnerable to nature, and is a clear example of nature influencing us in turn. Other examples raise the same concern: Are humans respecting the autonomy of nature when they clear-cut mountain slopes, thereby making their homes and villages more vulnerable to massive landslides? Are we respecting the autonomy of nature by suppressing fires so that we are then more vulnerable to large-scale mass fires? I’m not sure what to say about these examples. On the one hand, these examples of human influence on nature that make us more vulnerable to it illustrate the argument that humans are not in control of nature in such situations. The fact that when we dramatically influence nature it is often at the cost of endangering ourselves suggests that we are far from dominating nature (despite trying). Nature remains autonomous from us even in such cases of significant and damaging human influence. On the other hand, such human activities and the corresponding responses of nature are hardly examples of a healthy interaction between humans and nature, and increasing human vulnerability to nature through such dramatic influence is not a way to respect autonomy. of nature in relation to humanity. A comparable analogy might be to cause mental instability in our spouse with the result that our own lives are greatly negatively affected in turn. Perhaps these examples should be considered as examples of mutual dominance and not as types of mutual influence that reduces the possibility of dominance. These examples suggest that the intentions of humans whose activity increases their vulnerability to nature may play a role in whether one should characterize this activity as a step towards respecting the autonomy of nature in relation to humanity. They clearly show that increasing human vulnerability vis-à-vis nature is not a sufficient condition for acting in a way that shows respect for nature’s autonomy in relation to humanity.

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The Party is over: Oil, War and the Fate of Industrial Societies

(Book by Richard Heinberg reviewed by Qpooqpoo)¹

The analysis that is needed today must take into account ecological principles, energy and resource constraints, population pressure, and the historical dynamics of complex societies.²

This book³ has not done well with the passage of time. Many readers will remember the time when "peak oil" was all the rage. It had its heyday in the first decade of the 21st century: a group of academics, amateur researchers, and writers converged into a "movement" around the belief that industrial society was *closer* to collapse or a sharp decline due to the depletion of access to oil, on which that society was overwhelmingly and inexorably dependent. Industrial society was colliding directly with *limits* - specifically ecological and technological limits (the amount of geological oil left and the ability to efficiently access that oil) - they told everyone, and would soon begin its death throes as all aspects of the industrial system that were dependent on energy based on cheap and abundant fossil fuels began to shut down; the cost/benefit ratio of oil extraction would no longer make the effort profitable. However, the "movement" has disappeared: there are still believers in peak oil⁴, but they are reluctant to grant interviews. Most of the "institutes" and organizations they founded have ceased to exist; many of them will no longer comment on the subject. Many have shifted the focus of their attention to environmental damage and ecological limits in general. Others still cling to the notion, but push the turning point far into the future: they'll still say it's *near*; but they have displaced him into an indefinite future.

So what has happened? In a few words: The *technology*. Namely, peak oil believers based their notions on a poor understanding of technology and its interrelationship with society as a whole. They fell into this partly because of their naivety about the fundamental nature of the techno-industrial system and partly because of an uncon-

¹ Translation by Último Reducto. Original review in English. *N. from t.*

² Pages 208-209. As far as this analysis goes, this book misses where Theodore Kaczynski's *Anti-Tech Revolution* hits.

³ There is a Spanish edition of this book: *The Fiesta is over: War and economic collapse on the threshold of the end of the oil era*, Barrabés, 2006. *N. from t.*

⁴ "Peak oilists" in the original. *N. from t.*

scious wish - born of a legitimate concern for the destruction of wild Nature - that the industrial system would collapse soon.⁵

Both the discovery of oil and its rate of extraction depend heavily on technology. Technology is the independent variable. A single quote suffices to illustrate how Heinberg overlooks this fact:

As we have to drill deeper to find oil, and as we have to move to increasingly difficult and expensive areas to operate, the ratio of [energy] benefit to energy expended decreases.[1316]⁶

This approach is typical of believers in peak oil. It is their most significant common feature:

Technology cannot change the geology of reserves; technology can help produce faster, but not more...⁷

This perspective seriously overlooks how technology changes extraction efficiency over time, as well as how energy demand changes with that efficiency. Demand evolves due to changes in the efficiency of energy use in the industrial system. This changing demand due to changing efficiency in oil use is matched by changing efficiency in oil extraction - *the technological system is an integrated whole and the systems that enable more efficient use are interconnected with the systems that allow further expansion*. The net result is that the total price-to-benefit ratio of oil extraction can remain more or less constant *as long as* the technological system is capable of continuously advancing as far as it goes. efficiency is concerned. In this regard, while it may certainly have to seriously confront the limits that compromise its expansion at the cost of transforming the natural world (and indeed it is currently experiencing serious social and environmental problems that threaten to severely destabilize it), there is no reason to think that it will hit major barriers as abruptly as peak oil believers believe.

To better visualize this process, let's look at some concrete examples. The more efficient the industrial system becomes at extracting a resource, the faster it extracts that resource. The search, extraction, storage, processing and transport of oil - the entire cycle from the subsoil to the pump - becomes more efficient as the efficiency of the entire system increases. Opportunities for efficiencies exist in all areas, including hitherto unknown areas, with radical new techniques allowing more subtle and profound capabilities. These include, but are not limited to: improved 3D radar and mapping techniques, machine learning, artificial intelligence, robotics, nanotechnology, chemical processing techniques, mechanical engineering techniques (more fuel-efficient

⁵ Above all, this seems to be the case, of Richard Heinberg and John Michael Greer. Whether peak oil leads to collapse or not, it nonetheless promises a radical transformation of society that opens avenues for the realization of social dreams. For Heinberg, this seems to be a moment of crisis in which advanced society is forced to adopt more "sustainable" ways of life. For Greer, who follows a mystical tradition, the dream is a return to

⁶ Page 127.

⁷ Jean Laherrere, quoted by Michael Lynch, "What Ever Happened to Peak Oil?" Forbes magazine, June 29, 2018. Available *online* at:

engines and transmission improvements, mapping and more efficient coordination of logistics and the supply chain, computer-aided air navigation), etc. Meanwhile, human behavior and human resources continue to be regulated more and more efficiently as the technological system advances, through surveillance techniques, organization, education and propaganda, etc. As the technological system has grown, it has allowed for more efficient extraction and use of oil - while maintaining a degree of availability of oil that is stable enough for the system to continue to grow.

There is enough oil and coal in the ground - they just exist - to supply enough energy to sustain current usage rates for many hundreds of years. This is bad enough in itself for those of us who rightly understand that the industrial system must collapse soon if we want anything left on the planet. However, we must also keep in mind that this process is not limited to a single type of natural resource. Simply put, Providence did not dictate that oil, coal, uranium, etc. were the only raw materials that provided energy to industrial society. There is no reason to believe that, as the technological system grows, this trend of discovery and extraction of resources will not continue and that there will not be other "resources" of the earth - hitherto unimagined - that can be used to produce energy.

The most worrying thing is that this process of transformation of the earth and of human beings should continue unabated, until nothing in the natural and wild world is free from technological alteration. The total result of the sum of all the systems that compete and interact artificially exploiting more and more resources is disastrous. As Kaczynski described in *Anti-Tech Revolution*, Chapter 2:

Like biological organisms, human self-propagating world systems exploit every opportunity, use every resource, and invade every corner in which they can find something of use to them in their never-ending quest for power. And, as technology advances, more and more things that at first seemed useless end up being useful after all, so that more and more resources are extracted, more and more corners are invaded... 8

The inability of peak oil believers to fully appreciate the problem of technology is probably due in part to psychological denial and in part to education and propaganda (in the technological system, for obvious reasons, technology is discouraged). people to think about the technology itself - the thinking itself is adulterated or the focus of their attention is distracted or away from the technology). However, the inability to appreciate the problem of technology is also a predictable side effect of certain historical ideological currents. While the industrial system was still in its infancy, during the period of Adam Smith and later Karl Marx, it seemed as if technology had unlimited resources at its disposal. Most people, at the very least, didn't even bother to think seriously about the long-term resource implications. Therefore, they had a "cornucopian" mentality: [1319]

For decades most economists have concurred in proclaiming that resources were indeed infinite... with each passing year humanity was cultivating an unquestionably bright future as it reproduced, transformed its environment, invented new technologies, and consumed resources.[1320]

But as the industrial system moved into the 20th century, and its negative ecological effects became widely known, we began to hear about:

. about ecologists, petroleum geologists, climatologists, and other scientists telling us that resources are limited, that the earth's carrying capacity for humans is finite, and that the biosphere on which we depend can no longer absorb the rapidly growing flow of waste from industrial civilization.⁸

Therefore, a particular mental construction was developed, which ended up giving rise to the basic intellectual framework of "environmentalism", namely: technological civilization is a phenomenon that stands apart from Nature and is seriously displacing it. Technological civilization must learn to live in harmony with Nature or else Nature will be destroyed and civilization will be dragged down with it, much like when a parasite kills its host. Since destroying technological civilization to save wild Nature was never an option to consider, the goal was to "plan", "organize", "control", etc. civilization so that it could live in "harmony" or "balance", or "sustainably", with Nature.⁹ However, this perspective overlooks a crucial aspect: technology *transforms* Nature to suit its needs, always. Technological civilization does not necessarily need to collide head-on with natural limits, since technology itself has the capacity to transform Nature and society in such a way that the transformed society can continue to be sustained (at least in the short term) by a transformed environment. What runs out of oil? It adapts by further transforming Nature and further controlling human behaviour: more desert ecosystems converted into solar parks, more nooks and crannies of the earth's crust invaded and exploited by ever more efficient extraction, more natural biomass harvested and turned into "biofuel", more education and propaganda conditioning human beings to act and think more efficiently and adapt to the new technological environment, etc., etc. Therefore, the old paradigm is unable to take into account the evolutionary dynamics of the industrial system, nor that it transforms Nature to fit its purposes.

Our current social system (determined by our level of technology) is the mechanism by which this adaptation can take place most efficiently (currently the economy of free markets and price signals, though perhaps a more advanced system will develop in the future). effective for technological growth and adaptation). Unfortunately, full awareness of this process and its implications for continued technological growth escapes (or is willfully ignored) by the vast majority of environmentalists: for them, either doomsday recedes continually beyond the horizon or industrial civilization is certainly making progress on the promise of living in harmony with Nature. Therefore, the old

⁸ Page 134.

⁹ And so we arrive at the current paradigm or worldview, of which the best representative in this case is the "founder" of peak oil himself, the geologist Marion King Hubbert: "The current global industrial civilization is harmed by the coexistence of two universal intellectual systems, partially overlapping and incompatible: the knowledge accumulated in the last four centuries about the properties and inter-relationships of matter and energy; and the associated monetary culture that has evolved from customs whose origins go back to prehistory. (Page 99).

paradigm remains. The systematic awareness of the technosocial system and how it evolves and interacts with the 12

Nature and with human beings is left aside.¹⁰

It may happen that the industrial system hits serious difficulties and begins to collapse. *But it is not certain that these difficulties will not be resolved.* The more challenges the industrial system faces, the more it will work to overcome those challenges and to sustain itself, even if it means sacrificing more Nature and more humanity. It is already hurtling like mad to “transition” to a “sustainable” system away from fossil fuels, and the more threatened it is by natural obstacles, the more ruthless and extreme its attempt to transition will become. Those of us who understand that the industrial system is a colossal evil that cannot be reformed cannot afford to sit back and wait for it to collapse due to natural obstacles. We must do everything we can to force it to collapse, the sooner the better.

Directly facing the problem of technology and being rational in our calculations is psychologically painful. It would be (relatively) more comforting to think that the natural world will soon impose strict limits on the growth of the system, such as that the system will be forced to either seriously contract or collapse. Unfortunately, an *honest* and *accurate* estimate of the *facts* does not support this notion. As Heinberg himself inadvertently acknowledges: “It is self-delusion to dwell on hopeful images of the future just to avoid having to face unpleasant truths or to avoid having to take difficult action.”

¹⁰ A good example of this is the way some believers in peak oil have moved away from the idea of “peak oil supply” and embraced the idea of “peak oil demand”. In this case, they think that alternative “green” energies are on the way to mitigating or nullifying the demand for fossil fuels. (Joe Romm, “Peak Oil Returns: Why Demand will Likely Peak by 2030”, *Think Progress*, February 22, 2016. Available *online* at: [[https:// thinkprogress.org/peak-oil-returns-why-demand-will-likely-peak-by-2030-86d6621c119c/%23.r7cz1o353](https://thinkprogress.org/peak-oil-returns-why-demand-will-likely-peak-by-2030-86d6621c119c/%23.r7cz1o353)][<https://thinkprogress.org/peak-oil-returns-why-demand-will-likely-peak-by-2030-86d6621c119c/%23.r7cz1o353>].

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