Lynn White Jr. and the greening of religion hypothesis

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Abstract

Lynn White Jr.'s "The Historical Roots of the Ecologic Crisis", which was published in *Science* in 1967, has played a critical role in precipitating interdisciplinary environmental studies. Although White advanced a multifaceted argument most respondents focused on his claim that the "Judeo-Christian" tradition, especially Christianity, has promoted anthropocentric attitudes and environmentally destructive behaviors. Decades later, some scholars argued contrarily that Christianity in particular and the world's predominant religions in general were becoming more environmentally friendly, a perspective we term "The Greening of Religion Hypothesis." To test both sets of claims we have conducted a comprehensive review of over 600 articles – historical, qualitative, and especially quantitative – that are pertinent to them. Although definitive conclusions are difficult our analysis of extant research has identified many themes and dynamics that hinder environmental understanding and mobilization, whether the studied religion is an Abrahamic tradition or those originating in Asia. On balance the reviewed research supports the thrust of White's thesis but not the Greening of Religion Hypothesis. Extant research also documents that indigenous traditions often foster pro-environmental perceptions and suggests they may be more likely to do so than other religious systems, and also, that some nature-based cosmologies and value systems, which are often deeply informed by the sciences and direct experience within environmental systems, function similarly. Given space constraints here we focus on Lynn White Jr.'s thesis and subsequent assertions that Christianity is becoming more pro-environmental. Although we have been able to arrive at some conclusions with regard to White's thesis and subsequent claims that arose in part in response, it is also clear that additional research is needed to better understand under what circumstances, and communicative strategies, religious or other individuals and groups might be more effectively mobilized in response to contemporary environmental challenges.

Keywords: religion and ecology, nature religions

Introduction

In March 1967 *Science* published "The Historical Roots of the Ecologic Crisis" by historian Lynn White Jr., which became one of its most-cited articles; by 2015, 779 times in the Web of Science's core collection and according to Google Scholar, 4,600 times in the wider scholarly world. Although the essay also discussed the role of technological innovations in medieval times it was White's hypothesis about the role of religion in environmental decline that created a decades-long furor. Specifically, White contended that Western scientific and religious ideas, working in concert, precipitated the ecological crisis and continues to influence attitudes and behaviors, even in the increasingly secular world. This included Christianity's "implicit faith in perpetual

progress" (White 1967, 1205) but especially its anthropocentrism and disenchantment of nature.

This anthropocentrism was established in early Judaism and expressed in the Hebrew Bible, White argued, in which "man named all the animals, thus establishing his dominance over them" (White 1967, 1205) and moreover, God made the world "explicitly for man's benefit and rule" because only humanity "is made in God's image" (White 1967, 1205). The disenchantment could be traced to early Judaism and the wider monotheistic antipathy toward pagan animism, which led Christians to eradicate sacred groves as "idolatrous because they assume spirit in nature" (White 1967, 1206). White further averred, "we shall continue to have a worsening ecologic crisis until we reject the Christian axiom that nature has no reason for existence save to serve man" (White 1967, 1207). White thought Buddhism and Animism could promote pro-environmental behaviors but that they were too alien for most Westerners, who could more easily find inspiration in St. Francis of Assisi, who expressed a love and reverence for nature, and whom White proposed "as a patron saint for ecologists" (White 1967, 1205).

Perhaps in response, in 1979 Pope John-Paul II declared Francis as the patron saint of "those who promote ecology" (John Paul II 1979). Thirty-five years later, Cardinal Jorge Mario Bergoglio, when elected Pope in March 2013, selected Francis as his papal name, signaling pro-environmental intentions. Soon afterward, in May 2014 Francis convened a workshop on environmental sustainability that included prominent scientists, which was followed in June 2015 by an encyclical, *Laudato si'* ("Praise Be to You; On the care for our common home"), in which he insisted that the world community accept and act upon the scientific consensus regarding the harms and risks of anthropogenic environmental change. At many points, Francis appeared to be responding directly to White's criticisms.

Because White's critique was published in *Science* his conclusions were highly influential, as the environmental essayist Wendell Berry noted, "the culpability of Christianity in the destruction of the natural world, and the uselessness of Christianity to any effort to correct that destruction, are now established clichés" among many environmentalists, which the Sierra Club's executive director Carl Pope also acknowledged (Berry 1993, 93–94; Pope 1998). Some Christians responded, however, by asserting that their traditions enjoined good environmental stewardship, while others acknowledged some complicity and sought to reform their traditions (Hessel & Ruether 2000). Additionally, some religionists from other traditions likewise set out to make their traditions more environmentally friendly. Observing these developments, some claimed that Christianity, as well as other religions, have been becoming more environmentally friendly, or at least, are taking important steps in this direction (Tucker & Grim 2001; Tucker 2003; Grim & Tucker 2014; Gottlieb 2007; Sponsel 2012; Sponsel 2014). Such hopes were expressed in a 2014 article in *Science* claiming that the initiatives undertaken by Pope Francis were highly significant (Dasgupta and Ramanathan 2014). Two national public opinion surveys conducted in 2015 (one, shortly after Pope Francis

journeyed to the United States to promote his encylical) found a significant increase in agreement that anthropogenic climate change is occurring and that action is warranted, especially among American Catholics and evangelicals (Mills et al. 2015; Maibach et al. 2015). Yet surveys following news events often capture shortlived opinion shifts, so it is premature to predict Pope Francis' long-term influence.

The fact is that little of the post-White ferment has involved *scientific* inquiry into whether and if so to what extent and why religions hinder or promote pro-environmental behavior. And the highest quality scientific studies have not received as much attention as journalistic and anecdotal reports of environmental mobilization by religious individuals and groups. Nor has there previously been a systematic survey of the scientific studies that have been undertaken. We have, therefore, undertaken a comprehensive review of over 600 qualitative and quantitative studies that address White's thesis, as well as assertions that began to emerge in the 1990s that the world's religious traditions are becoming more environmentally friendly, a claim aptly termed "the Greening of Religion Hypothesis" (Taylor 2011). Given the large volume of material we have reviewed, here we focus on Christianity in the United States in order to assess White's original argument as well as claims that Christianity is becoming more pro-environmental.

Methods

Our comprehensive review resembles that of disciplinary Annual Reviews, such as by Rudel et al. (2011) and Pellow and Brehm (2013). It began in 2012 when Taylor searched citation databases for research related to key words including: religion, spirituality, ecology, nature, Lynn White, anthropocentrism, environmentalism, nature religion, wilderness, biodiversity, and environmental beliefs, attitudes, religions, behaviors, movements and conservation, as well as topics that tap into experiences in nature, such as biophilia, awe, wonder, affect, emotion, and connection. In 2013 and joined by Zaleha and Van Wieren, we deployed a snowball technique that took the initial search as its starting point by looking for additional, relevant research in the citations found in the articles initially reviewed, eventually creating a database of over 600 articles.

During subsequent meetings and communications we organized the articles by the (1) genre and method; (2) type of religion or religion-resembling social phenomena under scrutiny; (3) date of data collection; (4) location of the subjects; (5) sample size (if applicable); and (6) the researcher's findings.

We discerned four broad types of findings: that the 'religion' under examination (1) promotes environmental understandings and/or concern; (2) diminishes such understandings and concern; (3) has no such effects; or (4) or the evidence is ambiguous or otherwise inconclusive. With regard to the genre and method, we found four main types:

(1) hortatory and normative; (2) historical/anecdotal (3) qualitative/ethnographic; and (4) quantitative/empirical.

The hortatory and normative articles purport to explain the proper understanding of a religious tradition while exhorting readers to ethical behavior that coheres with the supposedly proper understandings. Much of this literature is also apologetic, arguing that the writer's tradition is environmentally friendly. Since such articles are unscientific we have not discussed them in the present analysis.

The historical/anecdotal articles purport to illuminate whether some or all of the world's religions are becoming environmentally friendly. These articles typically examine statements made by religious organizations or individuals, or the efforts of those religious groups who are incorporating environmental sustainability into humanitarian aid programs. Such writings often indirectly pose the questions that the third and fourth type of study addresses scientifically.

The qualitative/ethnographic researchers, through interviews and fieldwork, gather insights and a high level of confidence about the dynamics they have been observing and how to understand them. Such researchers often make reasonable suppositions based on the patterns they observe. But without empirical research methods, including through a random selection of research subjects, their suppositions remain unproven.

Quantitative/empirical, randomized studies, through survey research and other methods that randomly select respondents, provide powerful means to test specific hypotheses and make generalizable claims – if and when the data warrant such conclusions. During our comprehensive review, therefore, we have been especially interested in quantitative studies.

Assessing White's Thesis and the "Greening of Religion Hypothesis"

A number of anecdotal and historical sources demonstrate that there has been some environmental mobilization among Christians in the U.S. (Fowler 1995; Kearns 1997; Shibley & Wiggins 1997; Hessel & Ruether 2000; Wilkinson 2012; McDuff 2010; McDuff 2012; Johnston 2013; Veldman et al. 2014; Stoll 2015; Kearns 2012). Many of these authors, however, make generalizations about the extent of 'greening' that is unwarranted given the evidence mustered. Fewer scholars studied whether religion promotes indifference or hostility to nature, perhaps because a belief that Lynn White was correct, although two of us have analyzed the ways some Christians resist understandings that their religious ethics should prioritize environmentalist priorities (Taylor 2010, 194, 203–205; Zaleha & Szasz 2014; Zaleha & Szasz 2015).

It is easy to provide anecdotal evidence in support of White's thesis, which focused especially on the Genesis creation story as the source of Christian anthropocentrism and the desacralization of nature. White did not, however, focus on the tendency of

religious people to attribute environmental changes to divine favor or disfavor, a dynamic that is especially strong with religions, such as Christianity, which stress the sovereignty of God. Such beliefs are rooted in the earliest scriptures of the Abrahamic traditions, including when God instructed Noah to build an ark and then destroyed all but one mating pair of the world's creatures in a flood (Genesis 6–9), tormented the Egyptians with fires, pestilence, frogs, locusts, parted the Red Sea as a means to liberating the Israelites from Egypt (Exodus 7–14), and promised environmental favors or punishments for those who would obey or disobey the ten commandments (Leviticus 26; see also 2 Chronicles 7:13–14). In concert with such beliefs many religious leaders and politicians have blamed natural catastrophes on disobedience to God (Steinberg 2006 [2000]) while contending that repentance is the way to prevent or ameliorate them (Mersereau 2013). A related view is that because God created and controls nature it is arrogant to think that human beings can significantly damage it, a position exemplified by U.S. Senator James Inhofe, who draws on such a view when calling science documenting anthropogenic climate change a "hoax" (Inhofe 2012). An interview-based study of evangelical Christians in Texas found such ideas to be common (Carr et al. 2012).

White also did not analyze Christian notions of an imminent apocalyptic end of the world, likely because such ideas became prominent through books and motion pictures advancing such ideas released after he wrote (Lindsey 1970; LaHaye & Jenkens 1995; Kearns 2011). Taken together, beliefs in God's sovereignty, including over end times, led many Christians to be skeptical of scientists whom they think deny the truth of the biblical creation narrative (Rosenau 2015; Veldman 2014). An ethnographic study of conservative Christians in Georgia found, moreover, that another barrier to environmental concern and action was reluctance to be associated with environmentalists, whom they consider to be spirituallydangerous pagans or deviants promoting abortion and homosexuality (Veldman 2014). Survey research found similar dynamics (Ellingson et al. 2012). These themes and dynamics were unmentioned by White but hinder environmental understanding and adaptation among some Christians.

With regard to the specific claims made by White, efforts to empirically test his thesis did not begin until the mid 1980s. The earliest White-inspired studies sought to test whether anthropocentric religious beliefs that God had given humanity dominion over the earth and other organisms is a key driver of environmentally destructive attitudes and behaviors.

Hand and Van Liere confirmed and complicated White's thesis (Hand & Van Liere 1984). They found that beliefs that God had given humans dominion, or mastery, over nature, varied considerably among Christian denominations, which in their study included Episcopalians, Methodists, Presbyterians, unspecified Protestants, Catholics, Lutherans, Baptists, and Mormons. More so than denominational differences, however, they found that the categories of "conservative" and "liberal" were more predictive of dominion views of nature: those affiliated with religiously "conservative" traditions (e.g. Baptists and Mormons), were more likely to endorse the idea of a God-given

mastery over nature than were individuals involved in "liberal" denominations (e.g., Episcopal and Methodist). The authors concluded that some religious groups express and promote a "mastery-over-nature orientation" but others have "a value orientation compatible with the demands of a limited world" (Hand & Van Liere 1984, 568).

Kanagy and Willits subsequently questioned White's emphasis on the significance of a dominion view of nature for predicting environmental attitudes and behaviors (Kanagy & Willits 1993). Previous studies had presented "ambivalent findings" and had mostly emphasized environmental attitudes rather than environmental behavior, they argued. They found that the greater the church attendance the less pro-environmental attitudes were present; nevertheless, some Christians also agreed that humans are part of rather than the rulers of nature, that people should preserve the balance of nature and limit growth in order to sustain the environment (Kanagy & Willits 1993, 676).

Woodrum and Hoban examined the significance of standard measures of religiosity, most notably biblical literalism, on dominion beliefs. In a telephone survey of 332 North Carolina residents they found that dominion beliefs were widespread and significantly linked to low levels of environmental knowledge, particularly among respondents with little formal or environmental education. But they did not find that those who subscribed to literal belief in Genesis were more supportive of the dominion beliefs than others (Woodrum & Hoban 1994).

Other early surveys examined whether beliefs in the bible were associated with environmental concerns. A general telephone survey of 300 adult residents in Oklahoma by Eckberg and Blocker, for example, found that belief in the bible was associated with antienvironmental attitudes, beliefs, and behaviors (Eckberg & Blocker 1989). They also found that respondents who identified with the Judeo-Christian tradition scored lower on their environmental protection index than those who did not. A subsequent study by Greely sought to expand Eckberg and Blocker's research, which had been confined to Tulsa residents, by using data from the 1988 General Social Survey. Greely confirmed that biblical literalism correlated with low environmental concern. He also concluded that non-believers (defined as agnostics/atheists and doubters) supported environmental spending more than theists (Greeley 1993). When comparing Catholics and Protestants, however, Greely found that Catholics exhibited higher levels of environmental concern. This difference he surmised was due to differing understandings of God's attributes, which Greely examined through a "Grace Scale" in which a "gracious worldview" was defined by images of God as "Mother, Spouse, Lover, Friend" (Greeley 1993, 24). Catholics with a high gracious worldview were just as likely as nonChristians to support environmental spending (Greeley 1993, 23). Moreover, adherence to greater political and ethical liberalism diminished the negative relation between religious adherence and environmental concern (Greeley 1993, 25–26).

The next wave of empirical scholarship, from the mid 1990s, expanded the types of religious beliefs and denominational traditions under consideration.

Several large surveys found religion-related variables to be weak or insignificant predictors of environmental concern. Kanagy and Nelsen's US-based study compared

three religious traits – regularity of church attendance, whether respondents identified as 'born again' – a marker of evangelicalism, and personal religiosity. The degree of personal religious experience was rated by relative agreement to these statements about the importance of prayer, belief in divine judgment, whether miracles happen, subjective feelings of the presence of God, and strength of belief in God's existence (Kanagy & Nelsen 1995, 37; Boyd 1999). The markers of relative environmental concern were based on willingness to support pro-environmental governmental action, and self-identification as environmentalists. The researchers concluded that religious variables did not predict an environmentalist orientation (Kanagy & Nelsen 1995).

In an analysis of the 1993 General Social Survey Boyd found that religious factors were weak predictors of environmental attitudes (Boyd 1999). Other analyses of these data found an association between anti-environmental attitudes and Christian theology but concluded that this was confounded by a pro-environmental effect with religious participation in general (Eckberg & Blocker 1996); this finding was likely because the different religious groups were insufficiently differentiated. But in this case, the negative influence of theology appeared to stem from dominion beliefs, although the authors stated that the data left them uncertain whether such beliefs were based on biblical or political views (Eckberg & Blocker 1996, 353).

In another US-based study that analyzed a national survey, Wolkomir and others found that neither biblical literalism nor reported salience of religion (namely, its importance to respondents in daily life) were associated with anti-environmental behavior. Moreover, when controlling for strength of dominion-theology, salience had a positive effect on environmental behavior (Wolkomir et al. 1997b). Another study led by Wolkomir, this time focusing on variance of environmental concern among denominational subcultures of Christianity, concluded (contra White) that theological dominion beliefs were not significantly correlated with environmental views (Wolkomir et al. 1997a).

Some survey studies have found both positive and negative relationships between Christian traditions and environmental orientation, depending on the particular theological beliefs and religious commitments examined. Guth and others, for example, drew on four data sets in their 1995 review, including the large sample 1992 American National Election Study. These researchers found that "conservative eschatology, religious tradition, and religious commitment" were negatively associated with environmental concern while "conservative eschatology" [was] by far the strongest religious predictor of environmental perspectives" (Guth et al. 1995, 364). The authors concluded that evangelicals are less environmentally concerned than Catholics and that of the subject groups surveyed "those outside the Judeo-Christian religious tradition–secular Americans–are the most pro-environment" (Guth et al. 1995, 377).

Tarakeshwar, Swank, and Mahoney found similar results in a study of the Presbyterian Church, U.S.A., in which greater theological conservatism was associated with less concern for environment and views of the "sanctification of nature" (in which nature has "sacred qualities" or is "a manifestation of God") was correlated with greater

pro-environmental beliefs and intentions (Tarakeshwar et al. 2001). A broad study drawing on the 1993 International Social Survey Programme, which focused on populations in U.S., Canada, Great Britain, and New Zealand, found no significant differences between Christians and non-Christians in terms of environmental concern in general. They did, however, find inter- and intra-denominational differences and that less environmental concern correlated with fundamentalist Christian religious beliefs; they acknowledged, however, that the research design precluded further conclusions regarding denominational variation (Hayes & Marangudakis 2000, 170). They also found that in three of the four countries studied Protestant Liberals were less likely than non-Christians to adopt pro-environmental stances (Hayes & Marangudakis 2000, 171). Their overall conclusion was that religion was a weak and inconsistent predictor of environmental attitudes across countries.

As alarm about anthropogenic climate change increased more researchers began to focus on the possibility that religion influences understanding and effective responses to it. In 1988 and 1999, for example, Djupe and Hunt conducted a two-stage survey of clergy and members of congregations in the Episcopal Church and the Evangelical Lutheran Church of America (Djupe & Hunt 2009). They found that members and clergy held pro-environmental views and concluded that "religious beliefs have little to no effect once social communication is controlled" and "a Christian worldview is not incompatible with holding pro-environmental views" (Djupe & Hunt 2009, 681). Their conclusions, however, could not be widely generalized because the denominations surveyed were among America's most liberal. Nevertheless, the study reinforced otherss that indicate liberal Christians tend to support environmental protection. In another study led by Djupe drawing on a larger sample that included two surveys – the first polling clergy in Ohio and South Carolina, the second involving a large national survey – researchers found a negative relationship between Christian beliefs and environmental concerns; it also found a sharp divide between liberal and conservative Christians with regard to environmental values (Djupe & Olson 2010).

Two particularly impressive studies have drawn on the large dataset generated by the GSS. Drawing on data in the 1993 survey Sherkat and Ellison sought to reconcile the sometimes contradictory findings from other studies by focusing on a multiplex of variables that they thought previous studies had failed to adequately consider (Sherkat & Ellison 2007). The researchers found that membership in conservative congregations and church participation drove political conservatism, which in turn encouraged views questioning the seriousness of environmental problems (Sherkat & Ellison 2007, 82). They also found conflicting results regarding the effect of religious variables on private and public environmental actions: Church participation had a positive influence on environmental behaviors such as recycling and carpooling that are not related to public policies but such participation, by promoting political conservatism, had a negative impact on policy-focused environmental activism (Sherkat & Ellison 2007, 82). In addition, the researchers concluded that stewardship beliefs have a positive indirect influence on environmental views by bolstering beliefs about the significance of environ-

mental problems; beliefs in the inerrancy of the bible, however, negatively influenced pro-environmental political action (Sherkat & Ellison 2007, 81).

Drawing on the 2010 GSS, Clements and others published two analyses of environmental attitudes and behaviors among Christians. In the first they found that Christians reported lower levels of environmental concern than non-Christians and thy concluded that the "presumed greening of Christianity has not yet translated into a significant greening of pro-environmental attitudes, beliefs, and behaviors of rank-and-file Christians in the U.S. general public" (Clements et al. 2013, 85). Indeed, "we found no clear evidence of a green Christianity among rank-and-file Christians in the general public. Indeed, the patterns of our results are quite similar to those from earlier decades, which documented that U.S. Christians were less pro-environmental than non-Christians, all other things equal" (Clements et al. 2013, 97). Clements and his collaborators also were among the first to analyze ethnicity concluding that "while there are no statistically significant differences in environmental concern among Mainline Protestants, Catholics, and Evangelical Protestants, we did find that Black Protestants are less willing to pay or sacrifice for the environment and perform fewer private environmental behaviors" than white, "Mainline Protestants" (Clements et al. 2013, 97).

The second analysis released by these researchers compared the 2010 GSS data with that of the earlier survey in 1993. Their objective was to assess whether differences had emerged during the time that had elapsed between the two surveys (Clements et al. 2014). They concluded: "the patterns of our results are quite similar to those from earlier decades, which documented that self-identified Christians reported lower levels of environmental concern than did non-Christians and nonreligious individuals" (Clements et al. 2014, 373). Although they found evidence of "some greening among evangelical Protestants, especially relative to mainline Protestants, between 1993 and 2010" (Clements et al. 373) they did not consider the role that a major economic recession that began in 2008 might have played in these findings (Kahn & Kotchen 2011).

Another study based on a dataset including over 55,000 respondents – the 2010 Cooperative Congressional Election Study – was able to analyze sub-groups within religious traditions in more detail than is typically the case (Arbuckle & Konisky 2015). The researchers teased out religious affiliations and commitment and found that, although there is significant variation within and between denominations, Evangelical Protestants were the least environmentally concerned compared to other Christians, and the greater the religiosity of Protestants (of all sorts) as well as Catholics, the less environmental concern was expressed, when compared to those who are less religious or not religiously affiliated. This was not, however, the case with Jews. The researchers also noted, as have many other studies, that other factors play a role in relative environmental concern – liberals and democrats more than conservatives and republicans, younger and better educated individuals versus older and lesswell educated individuals, and interestingly, women, minorities, and low-income individuals, have been found to

be more concerned about climate change, but of these, women tended to favor jobs over the environment. The main point, however, was that Christianity remained an important and usually a negative factor even when other variables were significant. The researchers concluded as well that their study provided evidence in favor of Whites' 'dominion' thesis (although dominion theology was not directly evaluated) while noting that, although they shared the same religious lineage and creation stories, Jewish individuals, especially reformed and conservative ones, were more environmentally concerned than Christians and those not religiously affiliated. The data led the researchers to suggest that the more respondents read the Bible literally the less environmental concern they typically express.

This was a plausible suggestion and has been indirectly evidenced by research conducted by the Barna Group of Evangelical Protestant pollsters, who produced three studies that compliment the findings of Arnocky and his collaborators, discussed presently. In its studies, the Barna Group compared the environmental views among different groups of Christians in the United States with those of the wider public. One of these studies found that "Christians—like most other Americans—are open to environmental concerns, but these issues tend to be relatively minor top-of-mind concerns" (Barna Group 2008). The study also noted that 89% of Christians and 85% of churchgoers had never heard of "creation care", an expression environmentally concerned Christians have increasingly used as shorthand for the idea that there is a religious duty to be good stewards of creation (Barna Group 2008). Moreover, most churchgoers had not heard sermons enjoining environmental protection (64%) (Barna Group 2008). Another study illuminated why: clergy are reluctant, even in liberal churches, to speak up about environmental problems for fear of alienating and losing parishioners (Szasz 2015, 163–164).

Another Barna study showed that there is considerably less concern about global warming (only 33% of American Evangelical Christians considered global warming to be a "major problem" compared with 59% of mainline American Christians, and 69% of atheists and agnostics), and less willingness to spend money on environmental protection, than among other segments of the U.S. population (Barna Group 2007). The Barna Group also found in a 2015 study that evangelical Christians have continued to place a low priority on environmental issues. For them, "the economy" and "abortion" ranked high as priority issues (at 69% and 67% respectively) but only 16% considered "environmental issues" to be a high priority (Barna Group 2015). Another study might help to explain the lack of environmental urgency among these religionists: it documented the prevalent expectation of an imminent apocalypse among many conservative American Christians (Barker & Bearce 2013).

In 2014 the Public Religion Research Institute released a methodologically sophisticated study focusing on religion and climate change in the United States (Jones et al. 2014). Based on a random probability sample of over three thousand respondents the study's size made it possible to illuminate the beliefs and attitudes of large religious groups as well as some smaller populations and sub-groups, such as American

Jews and Christians of different traditions and ethnicities. The results indicated that only 46% of Americans agreed with the scientific consensus regarding anthropogenic biosphere warming (although another 24% thought the world was warming but not because of human activities). Only among Jews, Hispanic Catholics, and those who did not express a religious affiliation did a majority concur with the consensus science (66%, 61%, and 57%, respectively). Only 50% of all Americans were concerned about climate change, whatever they thought about its origins. There were also significant correlations between conservative Christian theology and climate science skepticism. Certain doctrines, including biblical end times expectations, were influential, with 49% of Americans and 77% of Evangelical Protestants attributing natural disasters 'to "end times" as described in the bible', which is especially interesting because fewer, 46%, attribute climate change to human activities (Jones et al. 2014, 23). In line with other polls, white evangelical Protestants were far more likely to be skeptical about theories of anthropogenic climate change. But in a new twist, the study also revealed that black Protestants and Hispanic Catholics were more likely to expect that climate disruption would negatively affect them and others like them, and to support action to prevent such impacts, than were white Catholics and Protestants (Jones et al. 2014, 15). Lead author Robert Jones also noted, however, that the relatively high level of concern was among foreign-born not U.S.-born Catholic Hispanics, who were comparable to the American public as a whole (Jones 2014).

Discussion

A year after White's article was published geographer Yi Fu Tuan challenged his view that Western religious cultures were more prone to destroy their environments than Asian and Ancient ones (Tuan 1968). (For subsequent debates see Callicott & Ames 1989 and Kellert 1995). In an article published in *Science* in 1970, Louis Moncrief argued that White had overemphasized the role of religion and under-emphasized non-religious social and economic variables that have contributed to the environmental crisis; he also asserted that widespread environmental degradation in Asian cast doubt on White's view that Asian religions harbored more environmentally-beneficent beliefs than Western ones (Moncrief 1970; cf. Whitney 1993).

Given the complexity of social and environmental systems it is important to avoid overemphasizing any variable that might contribute to environmental degradation (Minteer & Manning 2005). It is indeed reasonable to wonder if White's insistence that the "Judeo-Christian" tradition bears a large share of responsibility for the environmental crisis overstated the role of religion in general and the religious traditions he targeted in particular. That White did not provide every qualification and nuance that might have been made in a more detailed study, however, does not mean that the main thrust of his argument is invalid. Our review of the empirical research since he

published his influential argument suggests that he was on the right track and religion does influence environmental attitudes and behaviors.

White was not just making a historical argument, however, he was making a ethical one, urging Westerners to reject anthropocentrism, take inspiration from St. Francis, and even create "a viable equivalent to animism" (White 1973, 62). In his own way White promoted reverence for life. And after White, increasing numbers (if yet distinct minorities) of Christian individuals and groups have sought to do just that. White deserves credit for precipitating much of the soul-searching and religious environmentalism that has emerged since *Science* published his argument.

Worldview transformation is underway around the world as a means to greater pro-environmental polities and behaviors (Taylor 2010). Some Christians are involved in promoting environmental concern and action within their communities. Yet extant research indicates that White's critique continues to have explanatory power even though he did not identify all of the themes and dynamics that hinder Christian environmentalism. Christians may agree with statements that they should be good environmental stewards but such concerns are often obviated by other variables. This may be because environmental concerns are at best, for most, a low priority. We will report additional findings from our comprehensive review in subsequent publications; these will document that the extant research is no more sanguine with regard to world's other predominant religions.

Although many have been effusively positive in response to Pope Francis' pro-environmental exhortations and supposedly growing influence, given the many themes that appear to hinder this-worldly environmental concern among Christians, as well as because previous statements regarding environmental responsibilities by religious elites have not significantly influenced individual congregations and parishioners, we do not yet know whether this Pope's efforts will bear long-term fruit (Vidich & Bensman 1968, 234–235; Szasz 2015, 163164). The first survey in the U.S. after Pope Francis issued his 2015 environmental encyclical, for example, did not bode well for his agenda: it showed a precipitous drop in his popularity (70 to 59 percent), which was especially steep among Catholics and political conservatives, presumably because the environmental and social justice causes he was promoting are highly controversial (Swift 2015). Perhaps further tempering the findings of the 2015 surveys that showed a modest increase in concern about climate change among U.S. Christians, a study released in early 2016 found (again) that the least religious individuals show the greatest concern about climate change while the most religious show the least concern (Roser-Renouf et al. 2016).

This much our research makes clear: claims or hopes that religions are coming (or might come) to the environmental rescue deserve careful, rigorous, ongoing, critical scrutiny (Taylor 2015).

White's most provocative claim in his famous article might have been: "Since the roots of our trouble are so largely religious, the remedy must also be essentially religious, whether we call it that or not" (White 1967, 1207). If this worldview-focused hypothesis

is plausible, and we think it is, then it merits more, rigorous, mixed-methods research in order to determine whether and under what circumstances, and through what sorts of communicative strategies, religious perceptions and beliefs (and entirely secular worldviews as well), can most effectively promote ecologically and socially adaptive biocultural systems. As White recognized decades ago, the stakes could hardly be higher.

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