

# How women drove the evolution of symbolic culture (Seminar)

the last half million years

Ian Watts

24/02/2026

This talk uses Chris Knight's 'sex-strike' model and Camilla Power's Female Cosmetic Coalitions model for the origins of symbolic culture. Ian Watts addresses anthropology's core question – what it is to be a modern human and how our symbolic species evolved. Ian focuses on what is widely considered to be the earliest archaeological residue of group ritual, the record of earth pigment use. The model's premise is that the maternal energetics of birthing and rearing successively larger brained offspring drove the evolution of female coalitionary strategies. Predictions concern: (i) details of the earth pigment record, (ii) how this would relate to the brain-size story, (iii) contextualising behavioural developments (e.g. campsites and lunar phase-locked hunting), and (iv) specifying an 'ideology of blood' at the root of symbolic culture, testable against the ethnographic record of myth and ritual. Ian calls on social anthropology in particular to engage with the model's predictions on the ethnography of hunter-gatherer myth and ritual.

---

<https://vimeo.com/1168642620>

---

There are two great talks, tonight's and next week's talk as well, being offered by people who have extraordinary interdisciplinary range across all the kind of necessary disciplines we have to look at to understand human origins, to understand the origins of symbolism, the origins of language.

Today we have Ian Watts, who's our long-term colleague, who's specially worked on the archeology of the African Middle Stone age, that he's going to be giving a really the kind of total all, all over viewpoint of emergence of homogeneous homo and what happened for the last 2 million years.

It's not just about women drove symbolic cultural evolution of the last half a million years.

Next week we have the linguist neuroscientist who's been doing amazing interdisciplinary work, work on the origins of language, Cedric books, who's also joined us here tonight.

So we are really pleased about that.

so Ian should be, so he's been a social anthropologist as well as an archeologist, and really studying everything that is needed to be put together.

he's been the pioneer.

He's been like first to establish that symbolic culture in Africa is way older than what was assumed in the nineties about the emergence of symbolic culture in Europe with the upper poly lithic and it was one of the very first to point out that this, that the actual record, for the African Middle Stone age gave a wholly different picture.

and he's famously worked with, sites that have a very deep record of the African pigments, the Northern Cape Vanderberg, collections, Lobos Pinnacle point, and he's gonna be telling us all about these.

But I'm gonna hand over to Ian now to put the whole thing together.

I'll try Yes. Will Bit of a challenge. I've got far too much material here, so I just hope I can get through it all.

symbolic culture is a world of shared fictions agreements about things that don't exist in the real world, but which are as real as the brute facts of nature.

For as long as people hold such fictions to be relevant, language is an aspect of symbolic culture along with things like paper, money, gods and promises, symbols are a unique form of information.

More importantly, symbolic culture is a unique form of information transmission.

The theoretical evolutionary biologist, John Maynard Smith, saw language and symbolic culture as the last major evolutionary transition in the history of life on earth.

When he proposed this in the mid 1990s with his colleague ILS s Maori, most archeologists were convinced that the earliest evidence for symbolic culture associated with the European upper Paleolithic beginning around 40,000 years ago, famous for spectacular cave paintings, sculpture beads and pendants and elaborate burials.

This seemed to present an evolutionary paradox as geneticists and paleontologists had just agreed on an approximate time and place for US Species ocean around 200,000 years ago in Africa.

How could something as fundamental as symbolic culture be unrelated to our speciation? This supposed paradox between modern bodies and modern minds became a roadblock to scientific progress that lasted for almost 30 years.

Fortunately, Maynard Smith and Saf Murray weren't too bothered by questions of time and place and went straight to the heart of the matter.

How could bans of very clever bipedal apes, most of whose members were only weekly related, establish sufficient trust for a realm of shared fictions to become evolutionarily stable? How did our ancestors come to trust in a cheap coded form of communication speech where it's so easy to lie? What was the mechanism? The only answer they could come up with was the one Durkheim had proposed at the beginning of the 20<sup>th</sup> century Group ritual in 1995.

This was about as far as anyone could go.

As it happened that same year, Chris Camilla and myself published a journal article called The Human Symbolic Revolution, a Darwinian account which addressed the same problem but with a tightly specified model making precise refutable predictions across several fields.

So I'll begin with a brief outline of this model.

The model became known as the Female Cosmetics Coalition Hypothesis, but it was essentially a more Darwinian version of Chris Knight's sex strike model of the origins of symbolic culture.

First off, the problem of how we became a symbolic species had to be placed in a broader, less abstract evolutionary context, recast in more materialist terms.

So hence my opening slide.

Brain size increase is the most distinctive feature of genus homos evolution of the last two and a half million years.

Big brains are expensive organs in modern humans.

They account for 20% of adult resting metabolic budgets increasing to over 60% among children.

As most of us know, a large part of these costs were met through a dietary shift towards higher quality foods, particularly increased reliance on animal fats and protein. Easily overlooked, however, is that costs peak during human reproduction, particularly during pregnancy and breastfeeding costs falling exclusively on mothers.

So the critical issue throughout has to be how homo mothers met their maternal energy budgets.

The short answer is that they had to recruit help from a growing circle of others.

Now given our interest in symbolic culture, which is a late development, we focus on these costs on how these costs were met during this last steep period of increase, rapid increase at the end, but constrained by earlier iterations of the same problem.

Another important aspect of the evolutionary context in the mid nineties was that archeologists have become skeptical of claims for a hunting and gathering way of life.

Going back the best part of 2 million years, there was no good evidence for Habs cooking or campsites until much later.

Within the last few hundred thousand years.

Much of the evidence that had been considered to support early hunting was reinterpreted in terms of aggressive scavenging the female cosmetic coalition hypothesis that in our proposes that in our lineage at least the solution to this maternal energetics crisis involved female led coalitions putting on costly song and dance ritualized performances to mobilize male labor in the form of periodic collective big game hunting.

The performances exploited a feature of women's sexual physiology menstruation that provided biological males with reliable information about fertility status, a queue of imminent fertility.

Instead of allowing males to pick and choose on the basis of fertility status or ritual, coalitions shared the blood around using blood substitutes like red ochre or powdered redwood.

Initially, this would be a context specific strategy triggered by relatively rare menstruation, making it harder for a wouldbe roving male to pick and choose on that basis.

But as the pressures on maternal energy budgets continued, coalitions needed to mobilize male labor on a regular basis, organizing their displays, irrespective of whether anyone was actually menstruating taken to its logical conclusion.

The strategy inverts standard Darwinian fertility signaling with pantomime performances of wrong sex, wrong species, wrong time, Creating gender as distinct from

biological sex and constructing the world's first metaphor, linking women's periodic blood flow with the blood of game animals marking both as sacred or taboo.

All of this was organized to a lunar rhythm with a sex strike at Dark Moon and the successful return of the hunt around full moon when men surrendered the product of the hunt to the women for the blood to be removed by cooking fire across vast landscapes, communities alternated between uterine blood defined kinship solidarity to honeymoon a period of more private heterosexual relations for those so inclined in terms of lunar periodicity.

The reason for things being this way round was that collective big game hunting expeditions might take several days and nights, so you'd want to optimize available natural light exploiting the nights when fairly bright moonlight followed sunset the sec in the second quarter the, how do I move forward on this? Oh, okay. No, if it doesn't, then just go. Okay.

The model generated a time resistant syntax to the mobilization of ritual power, which I just remind you of Here Are not gonna be able to go into this at all and it's all rather unlikely, but it generates predictions across a, the model as a whole generates predictions across a range of different, different disciplines, which is exactly what you want from a scientific hypothesis making should make it eminently refutable.

One of the archeological predictions was that the habitual use of red ochre used as a cosmetic blood substitute in these collective rituals should be established by 106 feet or 140,000 years ago, being close to the maximization of brain size in our lineage and thoughts to coincide with a period of acute seasonal stress.

Remember that in the mid nineties, almost everyone else assumed a cognitive Rubicon at around 40,000.

While we held that this predicted shift to habitual red ochre use by around 160,000 was the behavioral marker of our speciation, the stabilization of symbolic culture as an evolutionary stable Strat stable strategy.

In 2022, almost 30 years later, this prediction has been born out and I'll come to that at the end of the talk.

The rest of my talk expands on how we arrived at this last major transition in evolution.

The first part we'll consider the evolutionary background through early homo up until around half a million years ago.

A short middle section, we'll focus on the period leading up to our speciation and the final section will address group ritual red, the red ochre record, and hopefully lunar phase locked hunting, showing how all three were involved in making us a symbolic species, a process driven by the material needs of mothers.

Alright, Again, sorry if you could scroll that.

Oh, okay.

Yeah, don't worry about the detail of this.

This is a slide of canine sexual dimorphism showing modern apes in red on the far left and modern humans in red and the far right in between.

You've got ancestral apes and all these values are hominins so it while primate social systems are shaped by female priorities, apes have high levels of inter male competition for access to fertile females and this is reflected in pronounced canine sexual dimorphism.

Before genus homo with postictus and early osteo signs, this aspect of size dimorphism had dramatically reduced.

This suggests that females may already have dampened or lost signals of their fertile periods.

Easter signals making it harder for one or two males to monopolize fertile sex and allowing more males into the group, right? Yep. This chart summarizes brain size increase by fossil species with chimps and modern human humans shown on the right hand margin.

Our early bipedal ancestors and the various Zoho signs and paranthropus species had brain sizes comparable to chimpanzees and bonobos.

The earliest departure from this is, is with fossils tentatively identified as early homo, often called hains from around two and a half million years ago at the beginning of the Pleistocene, the trend of increase only stopped a short while ago, perhaps around 200,000 years ago in our lineage between 70 and a hundred thousand years ago.

For Neandertals, we started out with brains little larger than the chimpanzees and ended up with one three to four times the size compared to the ply scene, the Pleistocene is characterized by drier climates and successive ice ages In Africa.

This meant a trend of declining forest cover and increasing grassland accompanied by radiations of herbivores and their associated carnivore guild.

For evolving hominins who used to make nocturnal tree nests more open environments presented greater predation risk.

This would've been a selection pressure for larger groups, better able to detect threats and provide group defense.

Defense against large carnivores required multiple males in these open habitats.

The most dangerous time would've been the Knights of Dark Moon.

A decade ago, Chris and Jerome proposed that vocal coring by such large groups, particularly of females and young, would confuse and deceive predators.

It would also tend to align psychological, psychological, and entrain physiological states.

This may provide the deep time explanation why women almost uniquely among higher primates and uniquely among apes have an average cycle length, closely matching that the moon be this as it may in social species where both sexes have dominance hierarchies, larger groups come with costs in terms of feeding and reproductive competition.

Alliances buffer these costs both to protect, protect against harassment and to challenge for power.

Primate alliances are created and maintained through grooming and there's a strong correlation between group size and the time spent Grooming with a much larger groups of early homo alliances could no longer be sustained in this way.

So most evolutionary theorists think that the selection pressure for bigger brains concerned the cognitive demands of living in these larger groups dubbed the social or Machiavellian intelligence hypothesis.

Brain size increase continued through the span of homo erectus.

Early African erectus had cranial capacities in the range of seven to 800 cubic centimeters reaching 900 by 1.6 million years and over a thousand cc by 1.4 million.

During this and later stages of the brain size story, positive feedback mechanisms between larger brains and the social environment probably became a significant factor in continued brain size increase by the time of homoerectus, the energetic costs of giving birth to and nursing larger brained off babies could no longer be met through mother's own foraging efforts.

So how is this afforded? There was a dietary shift to higher quality foods and a range of biological adaptations, some of which facilitated the dietary shift so females got much larger enabling them to forage over a greater range in search of high quality foods.

Both sexes became more efficient in walking and running, so lowering their locomotion costs.

The developing brain in fetuses and infants was buffered against short term energy shortfall through fat deposition and costs were also spread out with slower growth rates, longer infantile and juvenile periods restricted to humans and toothed whales.

The grandmother hypothesis is that this enabled a mother to help her daughter rear an extra child and or reduce her inter intervals, thereby improving the grandmother's inclusive fitness through her daughter's direct fitness.

This required that a significant proportion of females were surviving to a post reproductive age and that hom in females had flipped the ape norm of male opat that females instead of males stayed in their natal groups.

Upon reaching sexual maturity, Kristen Hawke's grandmother hypothesis laid the groundwork for Sarah Hardee's cooperative breeding hypothesis.

Hurdy points out that largely due to the risk of infanticide, whether the by males or females ape mothers never allow others to handle their infants, something that's routine amongst hunter gatherers, she proposes that homo became the babysitting ape.

She also points out that the white clearer of our eyes helps others to read our intentions.

Something apes have no interest in doing so.

This is the DP evolutionary background to our hyper sociality and it primarily or in the first instance, concerned infants interactions with adults and heard he pits this scenario against the mainstream view.

The likes of Steve Pinker and Richard ran them the proposition that human cooperation arose out of Groupon group competition between male alliances the Beco school.

Now Pi Pinker was way out of his depth here, but rang him should have known better as he'd been among the first to stress the importance of female strategies amongst chimpanzees making his denial of female agency in our own evolution look all or more like ideology.

It's important to appreciate the significance of this proposed change from male to female.

Philo, philo, apri.

The standard anthropological assumption through the mid 20<sup>th</sup> century was that hunter-gatherers typically lived in Patrilocl bands, A view influenced by misunderstood Australian ethnographies and the lack of African data for Levi Strauss, this was the starting point for symbolic culture of men exchanging women.

The idea should have died in the sixties with improved understanding of aboriginal social organization and quality African data with the work of Lorna Marshall and Richard Lee on the Wan and James Woodburn on the Hadza.

If there was a hunter gatherer norm, it was for women in their peak reproductive years, especially for the birth of a first child to be living with mom and for a man to be performing bride service for his parents.

The African data particularly emphasizing his obligations to his mother-in-law.

However, by coincidence, this was also when great ape field studies were beginning to reveal a pattern of ape male opat and this gave a new lease of life to the poorly grounded anthropological assumption of patrilocl residents among pair bonded couples typically glossed as marriage.

Even Sarah Hery went along with this until her 2009 book Mothers and others.

It's taken half a century for challenges to the old assumption to be taken seriously, partly through the implications of the grandmother hypothesis and partly through genetic studies of uni parental variation as mitochondrial DNA and Y chromosome data showing that in contrast to farmers, African hunter-gatherer populations show a long-term pattern of women moving little and men moving greater distances.

Now these analyses are restricted to modern humans, but they challenge the assumption of continuity in male opat championed by Rob Foley and Bernard Chape turning from residence patterns to sex at sexual maturity to broader aspects of behavior.

There's no good evidence for homoerectus regularly using fire.

Contrary again to ring Richard ran them, nor for them having campsites, they seem to have been constantly on the move with males and females pro probably foraging in fairly close proximity.

The most famous cultural artifact is the hand acts first seen shortly after the speciation.

The defining feature of asurian technology, which lasted long after erectus in Africa, the Asurian a long A with the Al van and the very earliest stone tools are subsumed under the term early stone age.

So how did homo rxi access highly valued animal carcasses as early as 2 million years ago? There's some evidence for flexible strategies in the open grassland site of kra.

They focused on juvenile antelope in the slightly more wooded old habitats of vie a mix of ambush hunting of adult antelope and aggressive scavenging chasing off big carnivores has been inferred towards the end of the span of homoerectus.

A favored strategy seems to have been ambushing large animals at funnel points in the landscape where they might be driven into a bog or water.

For elephants and rhino, they try to isolate juveniles from their mothers and this becomes a characteristic of asurian fauna assemblages that they're largely juvenile animals of mega fauna.

There's a common misconception that hunting's all about meat as a source of protein, but that's misleading on two counts.

First, because we need fats and or carbohydrates to avoid metabolizing energy from protein when the body starts cannibalizing itself.

Second, because feeding a large brain doesn't just require more energy.

Brain tissue also requires Omega-3 and omega six polyunsaturated acids, and unless you are living on in a shoreline environment with access to shellfish, crustaceans, or fish, DHA is hard to come by.

It's largely restricted to brain tissue.

Globally environmental conditions become unstable over a period known as the mid glazed lysine transition between 1.2 and about 700,000 years ago.

The middle lysine itself only begins at 775,000.

The instability was due to a gradual shift from 41,000 year glacial interglacial cycles to a hundred thousand year cycles with the longer cycles as you can see here, having much greater amplitude of variation while homoerectus survived in parts of Southeast Asia to as recent tool as one or 200,000 years ago in Africa and Western eia, a new species evolved during the mid lysine transition probably between 800,000 and a million years ago.

This was to be the last common ancestor to the three main homo lineages that evolved through the middle lysine ancestral to Homo Neal Homo Long, that's the Devan and ourselves homo sapiens little known about that last common ancestor, but with the daughter lineages brain size had clearly increased.

Again, the orange lines in this chart show periods of steeper brain size increase the first with early homo, the second with middle lysine hominids.

This more resolved chart shows within species brain size increase with steeper rates of increase among our own and neandertal lineage lineages compared to earlier species.

This is important because it suggests that selection pressures on female reproductive strategies would've continued throughout our speciation.

Focusing on the African middle lysine, the period from 775,000 to 130, 130,000 years ago, it appears there's an initial increase at the beginning of the epoch and a final increase towards the end from around 315,000 associated with the earliest homo sapiens fossils.

Notice the continued increase in the lower bound to the distribution from 315,000 supporting the inference that early homo sapiens mothers continue to face maternal energetic stress.

The initial increase is partially a function of increased body size, but that's not the case with the final period of increase.

Whether this apparently two step temporal pattern is real or not, or whether it was more continuous can't currently be resolved.

As there are too few fossils from the middle of the epoch to tell, and one of them salay is clearly an outlier.

Another unresolved issue is whether all the pre sapiens fossils are one species currently called ensis.

They're big and robust with pronounced brow ridges like the 600,000 year old cranium from Bodo in Ethiopia And this 300,000 specimen from Cab Zambia, both with cranial capacities of around 12 12 50 cubic centimeters behaviorally during the mid ene transition.

There are some changes in the archeological record in Africa.

There are refinements in hand ax production and the first steps in the domestication of fire inferred from about a million years ago at VT Cave on the southern edge of the Kalahari.

A slightly younger site in the Levant Geisha Ott Yaakov at around 780,000 is more informative with phantom halves and repeated evidence for the cooking of catfish.

This is probably the world's earliest oldest campsite, but there's little evidence that this became a widespread adaptation at this time in Eastern and southern Africa.

A major technological change occurs around half a million years ago with the earliest prepared core technology for making points and blades, some of which were haled.

They Initially appear alongside hand axes in transit in industries like the Forest Smith in southern Africa, although poorly dated the forest, Smith is thought to span the period between 500 and 300,000 when the hand AEs in Cleavers disappear.

Beginning around 300,000 years, we've moved into the African Middle Stone Age or MSA.

Even though the MSA is only is only negatively defined, it's beginning associates with our speciation, but in some regions it will last until as recent as 25 or even 12,000 years ago.

For me, what makes the Forest Smith really interesting is that it provides the earliest evidence for group ritual.

Throughout the early stone age, the only archeological evidence for any kind of signaling have been thumb late to shuan hand axis, perhaps in the order of six or

700,000 with showing exceptionally controlled retouch and symmetry, sometimes also exceptionally large.

These seem to go beyond functional requirements and might have been a form of ritualized display advertising fitness qualities of their makers, presumably individual males.

In the forest myth, we see something qualitatively different together with colleagues Michael Anne and Jane Wilkins.

10 years ago I published what are probably the world's earliest pigments from three Forest Smith sites in the Northern Cape.

Now to keep the momentum of this evolutionary narrative going, I'm gonna skip over the pigment use for the moment and is bearing on group ritual and come back to it shortly.

The forest of Smith points at Kaan have provided the earliest plausible evidence for stone tip spears at around 500,000.

They're thought to have been used as thrusting rather than thrown spears.

At this juncture, it's easier to tell the story using uation rather than African data.

Wooden spears have been found in Essex and in Germany respectively dated to around 400 and 200,000 experimental replication of the fire hardened.

She shenanigan spears suggest that they were effective javelins also from around 400,000 onwards.

There's repeated evidence across Europe and the lavant for collective hunting of medium sized fauna, horses, deer bison using jump kills and drives into cul-de-sacs.

African evidence is porter largely due due to preservation biases In terms of social organization in Europe and the Levant from around the same time evidence of Hals and campsites becomes more common With the earliest evidence for fire at around a million years, it clearly took a long time for central place foraging to become established rather than any technological difficulty in the domestication of fire.

The delay probably reflects the cooperative challenge of establishing a campsite focused form of social organization.

The difficulty of establishing enough trust for subgroups of people, some only distantly related to go off and undertake different activities, return to a central place and share the benefits of this division of labor.

Fire requires constant tending if it's not to go out, women's gathering might be more productive if toddlers could be left behind in the care of others.

Men's collective hunting is necessarily logistical, but what's to prevent them from consuming the best parts themselves out in the bush? Some women might be willing and able to join a collective hunt, but would other women be okay with that? It's these kinds of coordination problems that only began to be sorted out with late homo lineages in the second half of the middle Pleistocene.

Over this same period, women's maternal maternal energy budgets were coming under renewed pressure with renewed brain size increase.

We saw that some of the cranium from the first half of the middle ene exceeded 1250 cubic centimeters from around 315,000.

There's that final steep increase with maximum values over 1,450 cubic centimeters with no change in body size from the fossils, our speciation appears to have been a two stage process with modern faces preceding a modern shaped brain, A modern face is simply tucked under the skull rather than projecting it first appears at around 315,000 at the Moroccan site of Jeb Hood.

This may be a PR byproduct of reduced loading on the jaws as a result of more cooked food.

Habitual cooking would itself free up more energy for brain tissue as it externalizes some of the costs of metabolizing food.

Modern brain shape is rounded or globular rather than elongated.

It's first identified as around 230,000 with one of the two cranial from Omo In Ethiopia, the shape change globalization is attributed to expansion and increased complexity of the peral cortex.

It occurs postnatally and would've required the reorganization of developmental processes.

So it's clearly the more significant of the two changes.

Generally, it's thought to have increased connectivity between different parts of different brain regions.

The parts of the cortex that underwent most change are involved with spacial integration and body cognition.

So it's thought that among other things this concerns how we perceive ourselves in relation to others.

We don't know how quickly globular brains became established as the norm across Africa, although several tens of millennia seem likely consistent with this inference.

Most of our derived genetic mutations are thoughts have occurred between 250 and a hundred thousand years ago.

So now I can go back to those first Forest Smith pigments group ritual and the FCC hypothesis.

All three of the Northern Cape Forest Smith sites that contained pigments had underlying asurian assemblages, two of which were very large, aside from a small loca fragment from the final asurian layer of vanderberg, none of these assemblages contained similar materials suggesting evidence of absence and that we're dealing with a behavioral innovation.

It wasn't just the immediate ancestors of homo sapiens who started using red pigments around this time.

The earliest European find is from an asurian site on the French Riviera at around 400,000 a site that's also been interpreted as providing the earliest evidence for an artificial shelter.

An early campsite, an Indian asurian site with utilized hematite is more than 300,000 years old.

But these remain isolated occurrences what might be considered tentative steps in early group ritual.

Red ochre is a generic term for any clay or rock that's sufficiently enriched with the iron oxide hematite to produce a red mark.

When a braided enrichments typically through oxidizing weathering the term, sometimes extended to relatively pure hematite and occasionally to the Platy crystalline form of hematite known asite striking for its glittery appearance when coarsely powdered and the metallic metallic sheen of the fine powder.

Now some archeologists like Lynn Waley and Tammy Hodgkiss say, ah, you shouldn't call these materials pigments.

That's an unwarranted assumption.

Stick with a more neutral term like red ochre or iron oxide.

The assumption is supposedly unwarranted because they suggest ochre may have been used as a sunscreen or mosquito repellent or for tanning hides or as a functional ingredient in the halting of stone tools.

The latest contribution to this skeptical tradition is the following comment from Francesco Deo, A specialist in use wear microscopy who ironically A, has been at the forefront of backdating early evidence for symbolism.

It is likely that in the early stages, ochre was used primarily for utilitarian purposes, for example, to counteract the negative effects of ultraviolet radiation and that later these functions were adapted and the use of OCA was incorporated into a growing body of symbolic practices.

Now I don't have time tonight to reevaluate these alternate hypotheses, so I'll treat this statement as a specimen case for the whole class of nons semiotic hypothesis to be judged in the light of the earliest good evidence for iron oxide use.

First off, all three forest smith sites included specula rite ethnographically.

Specula rite is only reported to have been used for visual display and most of this material is the silvery stuff.

Is is all. All the silvery stuff is speculate cross-culturally, it's among the most valued earth pigments.

This also seems a reasonable inference for the deep past.

Secondly, at vert cave, the forest Smith pigments came from the very back of the cave where it's pitch black some 140 meters from the entrance.

This unique space can only be used with firelight.

The processing and use of red ochre, hematite, and speculator in this unique space strongly suggests file it ritual display with the foot performers, bodies red and glistening, so much for the temporal priority of sunblock, hardworking or mosquito repellent analyses of later middle stone age okra occurrences, assemblages and fine context and in the same direction.

In 200,000 year old bedding material from border cave Lynn Waley found high frequencies of red ochre micro granules, which she interpreted as supporting the hypothesis that people went to sleep with.

Ochre covered bodies probably as close to a smoking gun for body painting as archeologists are ever likely to get.

This is the oldest pigment from that site, a chunk of specular hematite probably about quarter of a million years old in these basal layers, ochre is incredibly rare, so that in itself also makes most of those functional hypothesis rules them out.

This resembles Specular hematite from lion cavern, the oldest mine in the world.

Some 140 kilometers from border cave current provide in research will hopefully resolve this speculation when large MSA okra assemblages have been analyzed to see which pieces are more likely to have been scraped or ground preferential use of the reds materials is evident.

More specifically, the preference was for the reds and most saturated ochre.

The same visual properties also influence which pieces were more intensively ground taken together.

Starting with the Forest Smith speculate and the flint use at the back of Underberg Cave, a pretty compelling indirect case can be made for calling red ochre an earth pigment inferring uses body paint or cosmetic and for inferring context of ritual display, the same inferences might also be made by invoking the Uniformitarian principle.

The idea that processes in the present are likely to have operated in the past ethnographically among ochre using cultures.

The one in use is as a body paint or cosmetic among hunter-gatherer cultures.

This invariably includes ritual performance while modern human rituals occur within symbolic culture.

Both the logic of Durkheim's argument about the role of group ritual and contemporary Darwinism allow, at least in principle for body painted group ritual prior to symbolic culture.

Let's just remind ourselves how and why collective ritual is foundational to symbolic culture.

A skin changing embodied song and dance performance that embeds collective representations in the minds of participants loud and costly form of display designed to convince a possibly skeptical audience.

It was Chris in the late nineties who drew out the full implications of Durkheim's argument about the relationship between ritual and speech and language making clear a set of patent opposition in informal traits and I draw your attention particularly to the last ritual's, focus on body boundaries and surfaces and speech speeches focus on underlying intentions.

All of this offers a parsimonious explanation for the early use of red ochre as ritual pigment.

So now let's consider the earliest evidence consistent with any of the nons semiotic uses of Oka, all of which postdates 80,000.

It comprises in Africa, some bone oils with oka residues thought to have been used to pierce red and hides around 73,000 years ago.

A scraper with fat and red ochre on its working edge also thought to have been used on an re hide from 58,000 and various stone tools from several sites with ochre residues on their non-working edges thought to have been the half dead parts of those tools.

So what's going on here? Why would otherwise sober cautious scientists propose temporal priority for nons semiotic uses of OCA when all the evidence points in the opposite direction? I suspect that the short answer is that anything may be considered preferable to engaging with the female cosmetic coalition's hypothesis, which after 30 years remains the only model to have generated interesting refutable predictions of the earth pigment record alongside symbolic predictions of the ethnographic record.

Whatever the case is, time to consider menstruation, not only in terms of its physiological functions, but the information it provides to males and what this is likely to have meant for females higher primates.

Some bats, the elephant true and the spiny mouse are the only mammals to menstruate.

A hemocordial placenta allows the fetus to tap directly into the mother's blood supply rather than indirectly through the endometrial wall of the uterus.

It's a more invasive system resulting in more pronounced fetal mother conflict.

The fetus hijacks the mother's blood supply, increasing blood sugar levels and blood pressure.

Although poorly understood is thought that among great apes, at least menstruation is adaptive because of the energetic demands of growing relatively large brain, large brain babies.

Extending this logic with exceptionally high pregnancy costs, late homo mothers needed to screen out all but the healthiest embryos women have thickened and toughened the endometrial wall, making it a hostile environment for all.

But the fittest embryos hence the much more pronounced blood flow than in any other menstruating mammal.

Now, in natural fertility populations where most women spend most of their reproductive careers either pregnant or breastfeeding, menstruation is a relatively rare occurrence, probably just a few tens of times in a lifetime.

Something like a modern level of menstrual flow would only have arisen during the evolution of late homo lineages.

From a male perspective, visibly pregnant or breastfeeding females are unlikely to be fertile, but among other females of reproductive age, there's no reliable cue of fertility status except for menstruation informing them of impending fertility.

So males would be particularly attentive to a menstrual female hanging around possibly offering fatty tidbits to her, but she's the female least in need of such precious resources.

With mothers now needing much more regular male investment, they stood to lose out to a menstruate and it's this problem that Camilla's female cosmetic coalition hypothesis addresses.

It assumes that females already had coalitions comprising several mother-daughter subunits.

What do they do about a menstruating member of the coalition? Do they hide it or flaunt it? Hiding the fact would be difficult, particularly now menstrual flows was much more copious, flaunting the presence of a menstruate, the presence of a menstruate, but scrambling the honest information by sharing the signal using blood substitutes might be an attractive option as long as they could make male access conditional on MA meeting the coalition's terms.

Environmentally, most of our speciation occurred during two glacial cycles.

These two here, marine isotope states eight between three hundred and two, four five and MIS six between 195 and 140,000 as a lineage that evolved in low latitudes, mostly in grassland and Savannah habitats.

The most critical part of the year would be the late dry season when carbohydrates, tubers, berries, honey are in short supply exacerbating the problem, game animals are at their leanest as they draw upon bone marrow to compensate for poor quality forage and browse.

The greater rigidity of GLA glacial conditions would tend to exacerbate this seasonal bottleneck on survivorship and reproductive success.

So even if maximum brain sizes had stabilized by around 200,000 years ago, early homo sapiens mothers were immediately confronted with calor caloric and nutrient seasonal crises as they went into the penultimate glacial cycle 195,000 years ago, the start of the most protracted and arid glacial of the last half a million years.

Now in the nineties, we assumed a straightforward correlation between glacials and greater aridity, and it's since proved that things are a bit so simple.

Some areas like the Ethiopian Highland Highlands received increased rainfall.

Other regions like the catchment area around Lake Malawi experienced the most intense mega drought of the last million years.

So a modified form of ecological stress is still likely to be relevant, but probably applying in a more mosaic fashion than originally envisaged.

Yeah, so it's in this context that the FCC model predicted that a cosmetic ritual tradition should become habitual during this glacial, and we first predicted this back in 95, specifically that a shift from irregular to regular use of red ochre by around 160 to 140,000.

This couldn't be tested then as there weren't enough well dated sites.

Hey, this has radically changed over the last 30 years.

German archeologists recently conducted a meta-analysis of all African sites from the time of the earliest pigment occurrences around half a million years ago, up until 40,000.

They identified three stages, an initial stage with very few pigment data points.

Basically our Northern Cape Forest Smith occurrences up until 330,000, followed by an emergent stage between 330 and 160,000 and a shift from irregular to habitual

use at around 160,000 habitual use was defined as the presence of RA in over a third of all sites.

Most of the okra containing sites during the emergent phase post state 250,000 with the habitual phase okras present in at least a third of all sites is from this point at around 160,000 that the African Ochre record unequivocally departs from its ation counterpart.

Assuming that red re use from these early periods is primarily the resid residue of body painting, then habitual use strongly suggests habitual group ritual.

This was also Dap Chaus and colleagues conclusion.

The implication is that as a Pan-African scale, modern humans had a singular shared fiction conveyed by typically blood red pigments.

What was this ideology of blood? Our model predicts that it concerned the world's first metaphor, equating women's periodic blood with the blood of gay animals.

I recently reviewed the literature on African hunter gatherer ritual use of red substances, whether ochre redwood powders or blood, and unfortunately I can't go into the findings here, but the most consistent pattern shared by forest hunter gatherers, the hadza and the bushman was the ritual act performed by women where they applied red substances to a hunter's forehead or drew blood from that spot in order to restore or maintain his hunting.

Luck. Given that these groups are geographically separated by thousands of kilometers and genetically separated by tens of thousands of years, this symbolic practice may well be token a source cosmology going back at least 160,000 years.

Shortly after Bri Oaker use became habitual, the first of more conventional proxies of symbolic culture begin to appear the with tiny marine shell beads, sun bearing ochre residues from a Moroccan site providing a dating estimate of 142,000.

Over 20 years ago, I was involved with excavations at Blombos Cave on the Southern Cape Coast of South Africa.

This provided a complex geometric engraving on a block of red ochre dated to 73,000.

It was the 2002 publication of this piece that finally broke the assumption that symbolic culture was restricted to the last 40,000 years.

Although many researchers clung on to the idea of a mismatch between modern bodies and symbolic culture, the MBOs engraving was shortly followed by the earliest what would end the earliest beads also at around 75,000.

A few years later also at Blombos they discovered paint palettes of perman shell full of bright red ochre dating to a hundred thousand.

As far back as the late 1980s, a symbolically elaborated burial of an early modern human from kasa in the Levant was known to date to around 90,000.

This is a youth buried with a dear antler.

All of these early expressions of symbolic culture associate with red ochre as we dispersed out of Africa, sorry, associated with red re As we dispersed out of Africa, red ochre becomes something of a hallmark of our dispersal.

So going back to that period of our speciation, renoco use was becoming increasingly widespread.

Can we be more precise about the kind of male hunting labor that female cosmetic coalitions would've been trying to mobilize? And I think I've run outta time coming to near the end.

So basically this would be Luna phase lock nightstand hunting of the Hadza and the bushman.

It's we've got quantitative data with the hadza showing it to be far, their most productive form of hunting takes place in the night leading up to full moon.

It's restricted to the late dry season.

Oh yeah, this is a lovely ritual site, rhino cave in the hills of Botswana.

It's a massive Ian throat or yeah, it's a snake.

Basically a natural formation of the weather that's of, of, of, of the rock.

It's weathered this way and then with a, with a natural crack here, but it's been covered in scalloped out, sort of scrapings to give it a scaly appearance and the archeology beneath it suggests it may be in the order of 80, 80,000 years old.

the thing about the nightstand hunting, the important point about it is that it's the only way that you get that close to, to the game animals.

at, at a site in South Africa or Botswana, Botswana, that the average distance from the hunting blinds to the nearest game trail was just seven meters.

So before the invention of the bow and arrow when you only had a spear, this technique would've been absolutely critical and it is, it's the late dry season because the game aggregates around the few remaining water se water waterholes and we have to aggregate around those same places and it's also for both of us and the animals, it's a period of stress.

But for us, with this technique, we turned what was a period of scarcity into one of abundance that was, so this was male's response to female strategies.

The habitual use of red ochre mobilized the collective hunting I'm suggesting of nightstand hunting.

Okay, thanks Anymore of those sides and nothing There be some I'll stop the share on that.

Fantastic. What a see hum being a review of everything and we've got Ellen and Jerome here and Cedric and Alistair. That's lovely.

we've got questions in the room and I'll ask if, if we've got questions in the zoom.

Anybody here? Not Chris, Can I just, can I just say, well what sometimes a misunderstanding, sometimes it's our whole model is interpreted as, okay, what is, what is the yore doing? It's like a substitute for menstruation.

It kind of means menstruation when you haven't got enough real menstrual blood to use the yore instead, much rather think of exactly the opposite way round and as, sort of antidote to menstruation the point, the trouble with, I mean, Camilla points out that the word cosmetics relates to cosmos and, and unity.

The point about cosmetics is that to prevent particular features of, of the human body, male or female producing disunity, you got males poking around looking at which female might be you might be able to get her pregnant and of course soon to get that kind of thing.

You, as you put, as those diagrams show all sorts of conflicts gonna arise and, and, but cosmetic are to designed to stop that rather like wearing clothes even when it's not all that cold.

in order to kind of make sure that you don't have people poking around and looking at intimate parts of your body, you wear clothes, but the ochre is like wearing clothes.

It's, it's, it's actually antidote to meticulous particular signals.

In this case, we're talking about menstruation actually causing terrible division, terrible conflict.

Thanks Chris. That's helps a lot.

anybody else in the room? I don't wanna start talking.

Anybody on online you'd like to pose questions or has Ian blinded us with science tonight? I would like Ian to say something in ordinary language at some point.

I do think you not ordinary. No, I do think you Inspire people with technical term, but I looked across here and I saw almost everyone half asleep.

I mean you, you are such a brilliant speaker when you just speak to us.

Been very, You and I, I dunno, is there a way of Right Alistair, do you director Alistair? It's not much help now unless you just be a bit more specific I think would be, we can, I can ask lots of questions, but Alistair's got a question here.

can you, can you read my question or shall I read it for you? Well, Well why don't you say, Okay.

Well I had understood that we mature sexually up to 10 years before we mature mentally, whereas because we are collective parents, whereas chimps as single mothers have to mature mentally to be able to raise an infant and so they mature sexually after they've matured mentally.

Whereas the, the, the, graph you showed suggests a very similar kind of overlap, between chimps and, and humans.

All I'd say on that was that graph, the original is actually pretty ancient.

It's 69. I think That's for sure.

There's been a lot of work on life history variables since then, but I mean it was just to convey that both the infantile period and the juvenile period and of course the post reproductive career are all expanded.

Right, okay. Yeah.

But it, it's comparing the actual length of reproductive lifespan between us and chimps and it's not all that much different.

We, we've got hunter-gatherer, average first reproduction somewhat later than a chimpanzee one, but also there's somewhat later re length of reproduction.

So it's not totally, yeah, I mean, I mean that, that's true for the physiology, but yeah, I guess I'm thinking about the mental development that was the issue.

Yeah, that's another aspect. Yeah, sure.

Which is a good point for any Andrea and then Nick.

Yeah, That was incredibly fascinating.

I was wait, most time I wanna take you back to some fundamental points, which is what is it about mate selection that is automatically highly competitive rather than possibly cooperative? And I hear both what you might call a patriarchal and a feminist answer to the question.

So how easy is it to envisage low mate selection structures game rituals as opposed to high competition structures and rituals? Could, could you address that? Say sorry, I was just, sorry, say it again.

What to understand about feminist, about competition.

The, the name of the game is how do we conduct mate selection? Other words, how do we get down to, let's say, bonds, which lead to reproduction and I can imagine low competition solutions to that game and some people can imagine high competition solutions to that game.

So what what I want to see is there's a greater range of models of competition, which, Right, so Ian's chart with all the cake differences of the canines with the great apes, we are including very, ous oranges and gorillas.

and then that really reduces even with our early hominin by people hominins, where there's a lot of ape life, hi life history, but Ian was linking together with things like concealment of ovulation.

Now that concealment of ovulation, would create a situation where male on male biffing each other wasn't a good idea, which Carol Van Chis really focused on and that, males competing, if you wanna by being nice and cooperative may become more emphasized.

that would be another potential model, but the original reasons for that concealment of ovulation is liable to be to do with risk of infanticide by males who haven't mated.

Females could become threatening to the offspring of females potentially if they think it might inc increase their chance of getting more matings and that's something which is very well known among primates.

It's very frequent among many primates, species monkeys and vapes.

So, the, there are aspects of both competition and ways that competition can be done through increased corporation, but you're still trying to compete for that extra edge of chances of maintenance.

I like that bit that this building a model of successful mate selection where you are handling variables which seem to sit outside actual reproductive strategies where you're handling, increasing the survival rate of your offspring.

That Lokey said, kill that, that's something quite interesting.

Can you think of any other, what the first site might describe as external variables that are actually being addressed by late selection game? So lack of infanticide and case beers and what, so if, if induction IDE will be major, major costs for females, but obviously any kind of helpfulness by males as Ian's talking about actually providing

some little bits of fatty tidbits, flowers, chocolates, whatever, or putting up some shelves.

All of these things would be definitely, pretty useful and helpful and don't, don't necessarily require huge permanent pair bondings or marriage and weddings and stuff, but a lot of negotiation and kind and Again, not being, would you say that the, the, the permanence of manly local madly locality provides a a new suite of variables that you can seek to maximize.

So shes become possibilities when you have the metro locality that stays geographically fixed and shelves.

Yeah, you might want to, improve your campsites with all kinds of smart furniture, Ikea, whatever, but, yeah, I mean the ma the locality situation will definitely alter a lot.

Yes, but it, you've got a, a basis of cooperative childcare there.

It wasn't going a lot further this into the Sarah Hurdy aspect of it.

but he obviously mentioning that 'cause it, it's a bit and I think that, the what's happening between where Ian's showing really evidence of the beginnings of ritual, strategies and the earlier stages where Sarah her's positing with emergence of beginnings, larger brain erectors, with inter subjectivity are able to do mutual mind reading based in the fact of babysitting, babysitting sets that up.

Us being great tapes that did babysitting was what set up the cooperative inter subjectivity of mutual mind reading, looking in each other's eyes and letting each other read each other.

Remember something you said Ian, which I think might have been a sip of the tongue, but I think it was wrong.

You were saying that aaps have got no interest in detecting one another's intentions. Oh, Think no, no. Letting each other know revealing, revealing, revealing, yeah.

Yeah. Letting each other know intentions.

But I, but I also think it's a possibility to add onto Ian's narrative that certain aspect, once you've got into subjectivity and, and that kind of looking probing for and allowing each other to read each other's intentions with all kinds of things going with that, like in aversion to inequity and all kinds of things like that really levels of cooperation.

They'd still be they'd still be, we'd still get these female co this situation of the odd menstrual female in amongst a group of females who aren't menstruating and therefore, if you've still got the odd out would be alpha male.

We are gonna get that situation cropping up where maybe one of the alpha, one of the sort of slightly bigger headed males decides, oh yeah, let's do some, let's get to know this menstruating female starting to just mono, just get an edge of monopolizing reproduction that way.

One of the ways that those fe those already collective childcare coalitions, they're already collective childcare coalitions going on, could try and clamp down.

You try and negotiate hustle on that is by doing a bit of mimicry and mockery.

Something like the, what develops into what we know amongst the bayaka is wa jo doing a bit of being Oh that, oh that girl, she's flash flashing her menstruate.

Well look, we can do it too.

Ha ha, she, she's she's kind of being surrounded by the, there's a, there's a reason for the others to want to sort of crowd her out a bit and, it may not work every time, it may not work to the sort of full effect of a ritual Cary strategy, but there's gonna be interest in it going on even with erectors, even with the cooperative childcares.

even for we, we are now getting dating on y two cranium, which is, you are going back a long way.

Yeah, sorry.

We do, we had Nick next and then but Diana, but Nick, did you wanna go? I wanted to, I it is very, cause I remember you spoke, spoke before this and about the deep time of, re use and you were discovering ochre in older and older graves.

and that was potentially challenging these thesis because it was sort of, going on long before a spec our speciation.

Mm-hmm. So you, now are saying directly that there were earlier experiments that re was being defined that possibly, I, I dunno what your explanation for that is.

500,000 years ago, it will possibly be, emerging rituals experiments.

Absolutely. Later on there's a period where begins to expand.

You are saying you've understood correctly this only last 160,000 years go onwards, that it becomes absolutely, every ubiquitous and very widely used.

Yeah. So, so, so that is some sum, something I detect has been a development of what saying before, which is useful.

Mm-hmm. I was, another question around perhaps I'll let you answer that if I'm allowed to ask another question or she'll ask the other question now, which is related to that because it's about, I know Camilla has looked at Neanderthals, large ranges brains that was larger as us, and I think you've speculated that they would've had ritual in the, in the glacial appeal, maybe Glacial, and oh yeah, because in the glacial periods than there it's Much more reproductive synchrony.

so presume So what evidence is there for ochre in Europe plus, Chris Stringer gave his talk and last year, and he was actually seemed to me to be saying, bringing Denise wins work that he's calling the Asian huge, huge species, it long, pushing their species possibly back as much as a male. Mm-hmm. Expect It's not, it's not, it's like three cursor to that.

You can't say there species is there.

That is again, Yung two cranium.

So all of this is very up in the air.

Yeah. Well, I, I doubt, well I just on that, I don't see how you get three species of humans with the same brain size, more or less, same human development who've evolved from something, which isn't at all like us at all.

Or have they all evolved from homo rec, but in different, in different parts of the world.

It just doesn't seem, it just seems very unlikely to me.

What, what, what, what do I ever then if you've got homo high to against, which is what, which is usually seen as the precursor.

It's not, not nowadays.

And, and well used to be seen as preor.

It was, but even Chris Stringer has given up on that.

He and Chris has broke, broke.

Chris Stringer has broke, come away from it.

But now you're all, but really he's gone towards, whatever, a a a, a multi evolutionary thing of human multiregional. A multi No, no, It isn't multi-regional.

No, it isn't multiregional.

Well, it looks like, that's the easiest.

But anyway, that's a side thing that's have argument stringer.

But, but yeah.

Okay. I think what's, what, what, in a sense all that's changed is the, the amount of data that we've got to deal with.

I don't think the model itself has changed, because right at the beginning in 95, it was, it was a two stage model of, of what we call then sham menstruation as a, as a context dependent strategy that would be sporadic And eventually leading, leading up to, because of continued brain size increase to habitual use.

So, so what's happened is that that sham menstruation phase has been pushed further back with la largely, we knew about these Forest Smith occurrences.

They weren't well published before, but we didn't know how old they were.

It was only in 2010 that we got dates and they're not brilliant dates, but that they, they're good enough showing that they go back, they between three and 500,000.

So, Danny, and it may it may over time there's one piece at Vanderberg that may be 600,000 a little fragment, and there may be an Italian site that has something similar.

I don't, I don't think it's gonna go back much further than that.

You know, that, that there was good evidence in those northern Cape sites for evidence could that it wasn't absence of evidence, but tipping towards evidence of absence.

so that's, yeah.

and, and the, and the, and the two stages to the model that's, that says it was always been, I think Wasn't accusing you of, of the mortal of not being consistent, but of the, the, the evidence.

Yeah. And I heard you a few years ago.

Oh yeah. And we certainly, there Seemed to be a question that was slipping Yeah.

To way before, Bt certainly that's been backdated.

You know, we were thinking originally 300,000 because the earliest European evidence was about two 50.

People were thinking that the earliest African evidence, they generally ignored the forest Smith stuff and said two 50 to 300,000 in Africa.

And, and that's when the brain size, see, that's when they thought the brain size really kicked up.

So it made sense then for as a prediction that it would be, sha menstruation would be there rather than 500,000.

But, and although we don't have the evidence of, of brain size increase in the middle of the middle lysine, we know it had ha that, that that, that it was there in the early middle lysine.

So potentially the model could be extrapolated that far back.

But I don't think the data is supporting that and it may be with more fossils that we do find middle lysine increase, but who knows? But it see, Thank that was great.

The scientific evidence made it even more rich for me, so I really enjoyed it.

Thank you. I feel about the growth of the liberalization of the brain.

Yeah. And then I think you said something about how we perceive ourself among others to shape that and I wonder what some say about maybe making a link whether is not about perception of concealment, what concealment, of course, your cycle that's coming from being received before.

Well, I'm certainly not a person to talk about g globalization, but next week, next be is, is is just the person to, to, to ask about this next week. Yeah.

wait, concealment of ov of menstruation isn't what's going on with this model that, I mean, obviously not, it's figuring out Perception, leading cosmetic arrangements.

Mm-hmm. Maybe not the right word. No.

How we first need to feel perceived, right.

Yeah. Do something.

Yeah. Collective deception. Yeah.

Collective. Yeah. That's very much at the heart of it. Yeah.

Yeah. That would be great.

The process.

It is gotta be, it is gotta somehow, we just don't, I don't think we know how yet, but yeah.

Cedric next week will fill us, really fill us in on the brain science, neuroscience, developmental issues are key for his work.

Definitely. I, I have somebody online, Finn Lewis is Finn here.

Would you like to say something about your work on Noca? Yeah. I did a dissertation On er, using the road database and, partly inspired by that, DAP Sakas paper.

found like really, really strong correlations with like, especially the last glacial maximum, the dating that I used.

the method only allowed me to really look at MIS six really onwards.

I couldn't look at anything beyond more than a hundred and something thousand years.

But, in IS one, there was a really big drop off.

would you expect that perhaps be to do with like a transition away from hunter gatherer modes of life? And then the second part to that question is, in North Africa, ok use was just consistently low, from all sites in all periods.

And, we found, found it very hard to explain why that would be.

Yeah. 1, 1, 1 of the things I did, I, I left out was, if you remember the Dapkus maps, and there are large areas of Africa that are empty space for the Ochre record and you're right also that even in North Africa where there is ochre, it's not, it doesn't, it's not huge amounts and it's not many sites.

I think the main thing to be pointed out there is, is having sort of familiarized myself with the forest hunter gatherer literature and, and also remembering the, the, the bushman literature is how extensive the use of redwood is, and that it is used in exactly the same way as red ochre and in the ca in the Kalahari they're interchangeable, but in, in, in the Congo Basin, you don't have the rock outcrops to provide Oka, so you're not gonna find it there, basically, maybe around the rim of the, of the basin, but not, not in the heart of the basin and, and la and of course the large chunks of the Sahara that sand sheets and so on.

The same will be true.

Could I, could I just put in also and ask you, Finn, if you've got some, views on this, bi, which is this site that they're suggesting may even go a little bit older with the very oldest shell beads? Yes. And that has some significant amount of re there as, as far as I understand the be and that that is, and that's one of the key cutting edge Moroccan, sites.

But, just wondered if you had any, I'd love, I'd love to, I, if you've submitted your thesis Yeah.

MIS six years, I'd love to see that.

I, I'd be very happy to share it with you. Yeah.

I think one of the things that we were looking at was, where there are beads er tends to also co-occur.

So even in, even though it's generally rare in North Africa, there is that like early MIS six s five kind of, use of beads and that seems to be associated with the OK use that what the, the smaller amount of oka that is used there and after that it really seems to disappear alongside the beads.

Yeah. Interesting. But yeah, happy to share that.

I can send that to you.

Great. Great. Denise, you were gonna ask? Yes. I was just gonna say, at an ethnographic level, the thing that interests me is, girls menstruation rituals because it's collective and you emphasize the number of people involved and it's a communal thing and it has to do with beauty as well.

so it's very difficult to get my head around this very abstract language about something to suddenly coming in.

And it doesn't seem to me enough to just be able to cite the kind to make it collective from that.

So what is the evidence in terms of the quantity of red ochre and what age groups might be? Well, I mean, when, when we started this 30 years ago, what really grabbed me was the Southern African data on monarchical rituals.

cause thi this was the context where it was, yeah, it was the, the context where red re use was most consistently mentioned amongst all the different bushman groups.

and I just unfortunately just didn't have time to deal with any of the ethnographic material today.

now, in, in, in a more recent, in the more recent review, I mean, it's clear.

It, it's, it's being used in virtually all ritual contexts, but the, the, the, if you have monarchical rituals, some bread substance, redwood or, or, or ochre is, is going almost certainly going to be present and they, and you're right also that they are among the most socially inclusive incorporative rituals and obviously you've got your, your communal band wide dances as well, which couldn't often be a, a, a context for, for making up.

and you've also got contexts where, just decorating your ros, that that women would do that on a regular basis.

They'd reapply redwood to their SSEs, every few weeks.

so that, that's actually, so in, in quantitative terms, far more oak, far more pigment is likely to be used for that kind of thing than in, in, in ritual.

Now, how far that goes back, I don't, It must have archeological evidence On, on, on. Well, yeah, I did, I did say like that those utilitarian uses the hide dressing, does come through as, some, some ochre involvement in Hyde working from pretty early on, from sort of 80,000.

whether, whether, whether I, I suspect that that will be pushed back a bit more, and I don't think it, I don't think we're gonna see it that much in the middle Pleistocene more than 130, who knows? So are we thinking that there's, it isn't just mere tanning, it's a, It's definitely not tax that is a total misnomer.

Yeah, it's, it's, that's, it's a, It might have some preservative role, but it's primarily a decorative is a coloring agent and Perhaps that there's a sort of extra kind of presti or value or prestigious aspect to it because it is coming out of you ritual practice And, and, and the extra labor, labor and investment.

You know, you come out with a, a, a, a bright red, beautiful, beautiful garment, but that's taken a lot of time to grind the redwood and so on.

It's, it is, it is been an investment.

So it does count as a prestige. Good in a sense. Yeah. Dasha, did you want to say something? you're talking about Lavan Dar Yes. Yes.

thank you. I'm very ignorant about all this.

so I was just wondering, we have the roots of our patriarchal domination dominating colonizing, culture in the, from the Levant.

Is that, is there red ochre there, or were they, was it absent? Is that part of the problem? No, no, it is, it is there, but it is, it is.

I mean, it was the, it was what initially got people excited because it's there in both those early, I've forgotten the genus name that they applied to the early modern humans there.

But the, the species name was Palestinians, and these were, I showed you the, the, the, the adolescent, the, the, I showed you the Kasa burial with a adolescent, with a dears antler.

The neighboring site school is, is a middle-aged guy with a, with a boars mandible. Both those sites have provided red ochre.

It's not huge amounts, but it, but it's definitely there from a hundred, 115,000.

It se it, it, it seems to come, it seems to come and go.

Now, of course, different species come and go in the levan.

It's a corridor concertina area between the anals and modern humans.

and, and technologically they're very difficult to tell apart.

so may maybe we didn't stay there long and moved on fairly, fairly rapidly and then returned.

It's, it's, it's difficult to unpick what's happening there, but it's certainly, it's is the first sort of signal as we move out of Africa.

It seems to be the, a repeated thing.

Wherever we first arrived somewhere, and you see the red ochre and, and school Calsa caves were, and, and at school they were definitely heating yellow ochre to turn it into a red ochre.

Mm-hmm and they had some beads they Had, and they're both sites of, well, ca yeah, they gly shells with natural, which was, I don't think much Scandal anymore.

Margaret Ross Is just a cloak. Just the women Wear No, both.

Both generally the women, but yeah, men can have a cross as well in more purpose.

So double as a sleeping cover as well, and, and, and can be a carrying sack as well.

I was wondering whether it's worth just saying to everybody that that, Luna scheduled nightstand hunting, which he had slipped at the very end, is actually one of Ian's greatest achievements to, isn't it? I mean, to, to me it, anyway, I mean, to understand how the period of maximum scarcity was tended to a period of abundance, extraordinary discovery of a way of, scheduling your hunting just before Full Moon.

I was wondering whether you could just say a little bit more, one of the things I noticed, I know you obviously, you, you took us so, so much, Ian.

Yeah. One things you didn't say was about, about the lions, and there would be none, none of that would be relevant.

None of this is Luna stuff. Even the Luna length would Be Foundation For the Luna length Fi wouldn't have a 29.5 feet. Yeah.

It was right at the beginning. And I, and The moon had peace is the right thing.

Yeah. The moon certainly did, had tif, and that's why I said the most dangerous time was the Dark moon, dark moon because of its predation risk.

So I just forgot to mention that the predation is lion big hyena.

So, well, we, we've got that Homoerectus already chasing Lion of Kills, isn't they? Or of a scavenging. Yes.

I mean, they're getting it together. And I'd love, I'd love someone to try and take the, the nightstand hunting argument further. I Say perhaps, I mean, I think, I dunno if if Jerome's still here, maybe he's Jerome, if he is, Jerome is here.

It's just that I was having a chat with Jarome about the book we've been writing.

I don't know, as usual, Jerome's always feet his ground and experience and let's be accurate and Jerome was sort of saying, oh, well with the no way anyone would worry about what phase of the Buddha is before go hunting.

so you, you are making a point about a particular phase in evolution where without that we might have become extinct.

We, without that tip into, into culturally equipped family, sapiens may not even happened without that shift into it's, IIII think those populations were pretty small and that they, they, that they would sometimes in partic certainly in particular places have had a hard time, certain points during that penultimate glacial, from the 130 to 190,000.

So they could have been local extinctions and, the, the nightstand hunting primarily refers to Savannah and grassland environments.

But that is most of, aside from the forest, even in the forest rise and, the, the biggest of the antelope, and probably the one that would is, is most prestigious and most valued, the equivalent of the E in southern Africa is the bongo and I think the main way, I mean, we have very little information about how bongos were hunted, but I'd lay money that the main way would've been Luna phase locked hunting by sort lakes and panthers opened places in the forest, the waterholes in the forest does Jerome, Jerome, Jerome, Do you have anything to say about that bongo hunting? well, yeah, I mean, so bongo hunting is actually taboo for most groups.

I know. It's the, it's the classic Aquila animal that nobody touches.

so, but, but anyway, I mean, I think if you're talking about fat in the forest, things like elephants and pigs, are, are very abundant in that.

So that may change people's priorities.

but I, I mean, it was struck by the examples of nightstand hunting are both from Savannah areas, and it would make very good sense in that context.

in the forest, the, well, the, the, the, the moon doesn't necessarily penetrate very well through the canopy, even on a full moon.

So, night hunting is something which people do today with torches, but, I think in the past it, it wasn't considered necessary.

There's enough food around and it's easy to catch, if how.

but what I was interested in to just sort of have a, your thoughts on Ian is the process.

So if you have, sort of occasional local use in particular places, and they're dispersed and, and look rather far apart, at least from the archeological record, how do you explain the process by which that became standard among all populations of humans?

I mean, I'm thinking about the symbolic revolution being something that every human group has gone through.

So it's, it is not like there was some group somewhere that missed out and, and, it, it happened to everybody.

And, we are all evidence as language using, people that that happened.

So can you dwell a little bit more on that particular step? Yeah. Because it seems so crucial to understanding why we're a symbolic species.

Yeah, I mean, this is where the genetics is beginning to play a really important role showing this periods of interconnection and isolation of, of like, well, first of all, being able to identify genetic subpopulations.

So you, you've got a structured population that comprises subpopulations that are sometimes in, interconnected and sometimes isolated and this would've happened repeatedly over glacial interglacial, changes and so, and we, we are familiar with the example of the green Sahara, well, that, that would've happened several times over, over the course of our speciation.

so I don't, I don't see a pro, I, I, I think what's hap if you, if another way of looking thinking about it is how did a g globalized brain spread? Mm-hmm. because of the only, the early evidence for it, both those early fossils, Herto and Omo are both in Ethiopia.

Now. We don't, we have very few fossils, so that's why we can't tell how quickly it spread.

But like somewhere between 230,000 and 160,000, there was clearly a lot of inter connectivity between populations and that's precisely when the, this habitual phase of use by the end, by the end of that, that that got established.

Okay. And the mechanisms, Me, well, I I, I Just hanging out, I Yeah, I mean hanging out, but people, populations coming, coming into contact with each other and, and, and sharing Cosmetic language. Yeah.

Sharing, sharing that language, Blood symbolism, cosmetic language.

I mean, there, there will be a basis for something really shared culturally.

You said that the bongo was the Aquila animal, para excellence, you said, I think always implies moon menstruation, blood, all those things.

In some sense, that's the whole point about Aquila.

Yes. That's a good point, Chris. Trust you. Thank you.

Does the bongo, like the eland associate in any sense to the moon is the big question. Ah, Well, there's one I need to ask.

Ah, yes. We need to find a sense Needs emphasizing.

Sorry, Really briefly, is that all? There's one wonderful thing, I'm an atheist, by the way.

One wonderful thing about all the world's religions, unlike capitalism, it allows you to sell your grandmother if you can make a profit from selling here.

Unlike that, all the world's religions have the idea that some things are sacred and above all blood is the sign that the human body is sacred.

that where to where the oak is to say, don't touch unless I let you, that idea of sacredness needs to be part of it all as well as the idea of fiction and all the rest of it.

But it's nothing sacred, especially if the here, if the human body isn't sacred forget everything else.

Forget all the grammatical rules, all the culture, all the symbolism, everything else. Something have to be sacred.

You know, don't touch unless you, unless you're given permission.

I've got a a Alistair, do you wanna say, so you wanted to know from Ian about redwood, how it was, used? Yeah, I, I, I, I just, I just know about redwood because redwood is basically, Yeah. Now the, the, the, the, the main redwood is genus is, potato carpus, which is a leguminous tree.

Got one species up in the Congo, another species done in Southern Africa, where you, they also use some of the acacia is redwoods and they just dry is preferably, I think like when it's very dry and it's, I, oh, I haven't got the slides now.

I had a trunk, I had a picture of a trunk of, carus and it just literally bleeds a red resin from from, from, okay.

In a bark. So Thank You. Resin is generally treated as a medicine, but the wood itself is bright red as well.

particularly if it's been left left to dry for a long time. But Would that explain why, despite the fact there are a lot of very iron rich soils in West Africa, there isn't so much red ochre because they would have access to the redwood.

How, how, how, how wide is the range for the redwood and those other pigment? Right, Right, right, right, right across the Congo Basin, with the exception of Uri, which is up in the northeast corner, which, and it's on the edge of the basin going up into sort of hard rock, geology, e everywhere else, it is fairly widely distributed and of course because it's a basin, it's filled with sediments, so you don't actually get rock out crops.

So that's why they don't have the choice between re they don't have any oak sources of hookah.

Because, because, because, can you not, I mean, I, as you as I sent to you and, and, Chris and Camilla and Christine, I, I actually made red okra out of simple POTUS clay.

I dunno how good that was as ochre, but it was a relatively easy accessible source, if that's acceptable in terms of a color.

I can't, I'm color stupid, so I couldn't tell, but it looked pretty good to me.

Yeah, I mean, what it, whatever, I mean, there is a valuation put on the reds most saturated materials, but if, if, if, if a, but people will put up with second rate materials if for, if push comes to shove.

Yeah. Good. Thank you. Blood.

One quickly, because we need to Wind up one wonderful section in David Grabber's marvelous book.

God Yeah, Yeah, Yeah. Where he discusses how, where you can have, obviously you can have different types of paper money based on a gold standard.

He was saying that actually money when it's began to evolve based on a, a big block of redwood standard the, the, the way to accumulate, like in a bank, a huge amount of wealth.

It's not gold, it's redwood.

The tiv, the Tiv ritual debts among the Le Lele.

Yes, that's right. All that kind of thing. Yeah.

It's all mm-hmm. Out in equivalences of it, huge chunk trucks of redwood Have some, And of course, there and, and in North Africa, you've, you, you've got, Hena, henna Hena must be ancient. Yeah.

Yeah. And, just recently there's a, Levantine paper show identifying some pig, some plant pigment.

I can't, I don't think it was Hena going back about 15,000, but that's about the earliest claim for a plant pigment.

Oh, well, I think we should say thank you to Ian for a fantastic and ambitious covering everything. It sounds enormous.

The Ted K Archive

Ian Watts  
How women drove the evolution of symbolic culture (Seminar)  
the last half million years  
24/02/2026

<[www.vimeo.com/1168642620](http://www.vimeo.com/1168642620)>

**[www.thetedkarchive.com](http://www.thetedkarchive.com)**