Orbis Idearum, Volume 7, Issue 2 (2019), Pages 11-25

EXPANDING THE HISTORY OF IDEAS INTO PREHISTORY THROUGH COGNITIVE ARCHAEOLOGY

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Received 6 December 2019, Accepted without revisions
28 December 2019, Available online 7 January 2020

ABSTRACT

The authors explore the definition of a "prehistory of ideas," and both its similarities and differences in comparison to the history of ideas. They propose the word-and-concept "ethics" in prehistory, explain the timing of its evolution, and then take it into historical time in the Levant, using Biblical references. They propose that new findings from cognitive science, neuroscience, and genomics may allow the eventual crossing of the prehistory/history borderline in tracing a time sequence for ideas.

KEYWORDS: Prehistory of ideas, ethics, Bible, cognitive science, neuroscience, genomics

1. INTRODUCING A PREHISTORY OF IDEAS

The term "prehistory of ideas" appears at first to be internally contradictory. Could there be a such a field? The *history* of ideas is a multi-disciplinary endeavor that traces human word-and-concepts through time based on the way words are used, especially in literature but also, at the edges, in other formal writing systems that appear to have true grammars, like Egyptian or Mayan hieroglyphics. Travelling back further in time, we find patterns of art, architecture, and villages. Even earlier, we find different types of encampments, as for early *Homo sapiens* and *Homo neanderthalensis*. Different species huddled around fires and travelled out from central campsites in different ways, some using Euclidean geometry and others, a star-shaped pattern (Wynn 2009). It is reasonable to conclude that these two species thought differently and used various concepts that were voiced in different ways. How-

ISSN 2353-3900

ever, they left us no words.

Before these species, we find tool patterns, used and reused according to what must be, our eyes and minds tell us, something like a set of rules. Arrangements recur. The results point to different "styles." We know that whoever fashioned these placements of nicks-out-of-rocks had something in mind. For *Homo erectus*, who evolved 1.9 million years ago, finely made stone hand axes leave evidence that some *thing*, surely a "word-and-concept" as it is known in the history of ideas, existed in the minds of beings who were not yet quite as advanced as we are along the evolutionary lines of our genus Homo. These beings arranged their thoughts and projected those thoughts out onto the physical world using rules.

While it appears clear that *Homo erectus* had concepts (we surmise from his patterned tools), we ask: Did the species have words and therefore word-and-concepts? A consensus appears to be emerging in the literature that, from at least a mid-point of the evolution of *Homo erectus*, around one million years ago when the species learned to control fire, our ancestors probably had the biology to produce grammatical language (cf. Aiello and Dunbar 1993; Barnard 2008; cf. Gunz et al. 2019, 125). Was it fully grammatical, like ours, with infinitely recombinable phonemes and morphemes? Some say Yes, some say No. The point is that the "word-and-concept" very likely existed from around this point in human evolution. Our view is that it would have been very difficult for *Homo erectus* to leave Africa beginning one million years ago and colonize the rest of the Old World all the way to East Asia, if the species had not had at least a rudimentary language – that, and the dog, partially domesticated, but indeed the dog (cf. Rappaport and Corbally 2020, 90-91). The treks involved would have been too rigorous without these two companions: Language and the dog.

Therefore, *de minimis,* the history of ideas is about arranging word-and-concepts according to rules, through time. An enormous question is where those rules came from, and we address this question briefly, below, when we address the neuroscience of the concept of "ethics" – moral rules. Again, the bigger problem is that we have no words in the prehistory of ideas. Without words we cannot derive the same progressions through time. Or can we? Can we have a word-less prehistory of ideas? Or, can word-and-concepts be proposed, codified, contexualized, and named according to circumstantial (but still scientifically derived) evidence like population density, sexual dimorphism, age profile, and economy? Can related evidence for words substitute for words? Perhaps.

1.1. The Advent of Cognitive Archaeology

About a decade into the present millennium, pioneer archaeologist Thomas Wynn, at the University of Colorado, proposed an innovative approach to prehistoric cognition based on burgeoning new scientific fields: neuroscience, cognitive science, and paleoneurology (the study of the neurological systems of extinct species). The initial premise was simple. Given what is known about the existing species of the genus Homo, i.e., *Homo sapiens,* can we take the evidence from newer sciences and project it back into earlier members of Homo, and draw some conclusions about how they thought – i.e., about their cognition? Until Coolidge and Wynn published his approach (2009), most archaeologists had concluded the study of prehistoric cognition was too risky. After all, we would never be able to test *Homo erectus* like we can test modern humans in the laboratory. We can never dissect the cadaver of an extinct species, and we can learn only so much from "endocasts" (cast models of brains made from skulls of extinct species, which show ridges, clefts, and major brain divisions). Furthermore, we will likely not have a time machine to take us back to observe extinct species. Therefore, many concluded that "there is no evidence for prehistoric cognition," beyond lithic traditions. Some adventurously studied settlement patterns (Wadley et al. 2011), but still, there were no words, just patterns.

This argument could be used to challenge the proposed prehistory of ideas, but we contend that a prehistory of ideas is essentially a more multidisciplinary cognitive archaeology. They intersect, to good effect. They cross the history/prehistory boundary, which is an unnecessary artifact, using another (and not a complimentary) meaning of the word "artifact". The best "prehistory of ideas" would be anthropologists and historians working hand in hand.

As it turned out, using logic, population data, modern cognitive science, three-dimensional re-creations of the expansion of earlier species' brains based on data from living species and their skull forms, as well as the theory of population genetics and genomic studies of specific genes in humans and related species (Harris 2015; Bruner et al. 2018; Gunz et al. 2019), we have been able to conclude quite a lot about the prehistory of human cognition. The approach is highly multidisciplinary, cross-referencing results from many fields, and the best studies stand out for their reliance on many different types of analysis. We review this approach in Rappaport and Corbally (2020), where we give examples of its utility in studying advanced neurocognitive traits like reading, mathematics, moral capacity, and religious capacity. We also cross the history/prehistory boundary in Rappaport and Corbally (2018), in an examination of "compassion" as a form of decision making, including a word-and-concept sequence in Biblical texts. Finally, we take a strongly eclectic approach to network neuroscience by cross-

referencing studies in biology, paleoneurology, ethnography, and neuroscience in Rappaport and Corbally (2019). These studies are taking archaeology into new realms unimagined by specialists in "stones and bones" archaeology. What we are finding is that, when those stones and bones are analyzed *along with* findings from the newer sciences, as well as the ethnology of living hunter gatherers, and our growing knowledge of psychology and neuroscience, a great deal about earlier species' thought and behavior can be proposed. One of the latest compilations of studies in cognitive archaeology focuses primarily on lithic production and has been named, *Squeezing Minds from Stones* (Overmann and Coolidge 2019), which is an apt description. We prefer a multidisciplinary approach that squeezes meaning from data acquired using multiple analytical techniques. Any "prehistory of ideas" would not be for the faint of heart or the one-track mind, and it would require keeping up with multiple disciplines.

It is important for our proposal of a prehistory of ideas to identify its similarities and differences with the history of ideas in terms of methods for analyzing sequence or "path." The history of ideas traces word-and-concepts through time, usually by historical period or through dated historical documents. On the other hand, the cognitive archaeologist reconstructs a sequence of decisions within an individual prehistoric being. For example, Wynn explains that careful analysis of a *Homo erectus* hand axe provides a "*chaîne opératoire* [that] documents a sequence of decisions actually made by a prehistoric actor… As a method, it has provided some of our most comprehensive pictures of prehistoric minds in action…." (Wynn 2009, 148).

This notion of a cognitive sequence later becomes important in our proposition that moral decision making may have arisen first in *Homo erectus*. We find that one of the salient features of the neurocognitive capacity of moral thinking is the use of a timeline and understanding consequences on a timeline, within a social group. We reason that if *Homo erectus* could work along a timeline in conceiving and structuring a hand axe, the species could well reason along a timeline with respect to the consequences of actions, both "good" and "bad". All these mental operations appear simple to us – we use them every day – but they are beyond the reach of any other Primate species other than *Homo erectus* and *Homo sapiens*, and probably *Homo neanderthalensis* and other early hominid species with whom early *Homo sapiens* crossbred. Genomic analyses confirm archaeological findings on one, the Denisovans (Meyer et al. 2012), but deep data mining of the human genome also points to one, maybe two others.

2. Ethics: A Word-and-Concept in the Prehistory of Ideas

Word-and-concepts in the history of ideas can be defined in taxonomies at many levels of inclusivity, from the very general to the extremely precise. However, working in the prehistory of ideas does not often allow a high level of specificity, except sometimes with stone tools, dentition, and bones. We see good specificity in cognition, for example, in psychologist Coolidge and archaeologist Wynn's interpretation of Neanderthal forays out from camp in a "star-shaped pattern" and early *Homo sapiens* forays according to a more "Euclidean" understanding of the landscape (Coolidge and Wynn 2009, 195; cf. Gamble 1999). There is indeed a fundamental cognitive difference in the two approaches, and our early *Homo sapiens* ancestors must have realized a difference in how the two species behaved when they met prehistorically in Eurasia. Our neuroscience and cognitive science tell us that the navigation capacity is seated in the parietal lobes. However, did our ancestors have a word-and-concept for this difference in navigation? Probably, but it is lost to prehistory and we are now left to name it what we will.

In this short paper, we address a word-and-concept that is of more interest to most readers in the history of ideas than stone tools, dentition, bones, or even navigation. We investigate "ethics" or moral rules, which is a concept that is very basic to all human cultures. All humans develop in groups that define "good" from "bad" according to a set of rules. The origin of these rules is the subject of substantial debate. To date, most cultural anthropologists have interpreted moral rule making as an entirely cultural process. Recently, with the introduction of the notion of "cultural neural reuse" and its tendency to establish human neurocognitive traits that use the *same* neurological networks and organs, from group to group, some of us are beginning to suspect that rules are not quite as arbitrary as decades of cultural anthropology have maintained (Christiansen and Müller 2014; Anderson 2010). There may be favored neurological pathways, but network neuroscience is now in its infancy, so proof of this emerging thesis must await good data in the future.

Our working definition of "ethics" for modern humans of the species *Homo sapiens* conforms both to the facts of cultural variation that have been well documented ethnographically, and whatever lessons may emerge from the future results of network neuroscience. We define ethics as derivative of "religious thinking," which stabilized 150,000-120,000 years ago with the globularization of the human skull in response to expansion of specific brain organs (Rappaport and Corbally 2020, 167). The capacity for religious thinking gives rise to "religious behavior" in all its variety worldwide and through time.

We define "theological creativity" as a component of religious thinking,

which allows moral rules ("ethics") to be fashioned from desirable qualities of supernatural beings. Our institutional role for religion defines its purpose as supporting the social group, whatever that social group is. Theological creativity, as a neurological capacity, allows humans to accommodate the opposing forces of the stability and social support of religion, with social and environmental change, including unusual one-time events like the explosion of volcanoes, floods, and epidemics. What is interesting is the fact that moral rules, or ethics, can change. If modern humans did not have a creative component in their religious thinking, it could not continue to serve them, millennium after millennium. Religious thinking would become useless. However, we can see in the history of ideas that ethics can and do change. This is a capacity that is organically based, and so, a response to evolutionary innovations that hopefully can be traced eventually through the genomes recaptured from humans and others on the line to modern humans. The neurological components and operation of the components in religious thinking should be reflected in the genomes of beings on the way to being fully human, and modern humans, as well. Analysis of human and closely related species like Neanderthals allows us now to estimate when specific genes appeared in prehistory. Our own genome consists of a history of genes and when they appeared (cf. Harris 2015), and therefore, by extension, when the cognitive capacities related to the genes were enabled.

Ethics are cultural rules for preferred behavior, according to a continuum from "good" to "bad." We contend that moral rules, or ethics, first emerged in *Homo erectus*, according to our Human Hearth Hypothesis, rather than later in *Homo sapiens* (Rappaport and Corbally 2016a). The supernatural beings who populate all our species' many cosmologies and often teach us "right" from "wrong" were likely *not* present for *Homo erectus*. Still, it is possible that the first glimmers of beliefs in spirits emerged around a common hearth for groups of *Homo erectus* that ranged up to 100-110 individuals (Aiello and Dunbar 1993, 188). It was in that intense experiential context that we propose the word-and-concept referring to "moral rules" or "ethics" first came into being. The genome of *Homo erectus* has not yet been retrieved, but we feel sure that it will be, eventually. When it is, the appearance of some of the neurological features of moral discernment should be identifiable.

We present a full model for the emergence of moral capacity and religious capacity, based on recent findings in neuroscience, cognitive science, genomics, and population genetics in Rappaport and Corbally (2020, 73-163). The model includes an evolutionary progression for the appearance of moral capacity and its biologically based antecedents, which emerged in the neurology of a series of species in the Order Primates. Our hypothesis is that moral decision making and ethics evolved first in *Homo erectus*, 1-1.5 mil-

lion years ago, when the species learned to control fire, rather than later in *Homo sapiens*. We make this contention based on factors such as age structure, population density, prevailing African ecology, and the economy of *Homo erectus* (cf. Rappaport and Corbally 2016b).

2.1. Sequence of Evolutionary Innovations Leading to Moral Capacity and Ethics

We use the term "moral capacity" to signify the biologically based, neurologically enabled ability to make decisions of a certain type, in a certain way. We view "ethics" as creative cultural derivatives of that capacity, and so, rules shared within a specific group. The human moral decision-making capacity underlies its many overt expressions in all their variation through time and worldwide. Nevertheless, there are commonalities in the "phenotypic" expression of moral capacity (as opposed to its "genotypic" foundation in the genome). We see the phenotypic expression of moral decision making as a feature of groups, and if natural selection acts upon it, then it can be best understood to act at the group level. This assumption is consistent with the Extended Evolutionary Synthesis, which defines "multilevel selection" as a productive analytical approach in understanding specific evolutionary changes (cf. Rappaport and Corbally 2020, 34-39).

Phenotypic expression of moral capacity in *Homo erectus* and later in *Homo sapiens* almost always includes some degree of each one of the following: A mental step both back and up; an arbitration mechanism that operates along a timeline; an evaluation using a valence from good to bad; a regretfully dispassionate reasoning; a tentativeness in a mental balancing act; a sad rejection of "wantonness"; a capacity (but not a requirement) for empathy with someone receiving moral adjudication; the experience of a burden; resolution on the part of the group; hope and faith in the future on the part of the group.

Note again that our model of the evolution of moral capacity shows it pre-dating religious capacity, which we find only in *Homo sapiens* and for very good reasons related to the expansion of specific brain organs that are involved in religious thinking, including: the precuneus (part of the parietal lobes), the prefrontal cortex, the cerebellum, and likely the maturation of the frontoparietal control network and connections with the cerebellum (Dixon et al. 2018; Smears et al. 2018; Tanabe et al. 2018; Rappaport and Corbally 2020, 122-124). These expansions give rise to the globular skull shape so characteristic of *Homo sapiens*.

We position the emergence of morality within a series of biologically based innovations along an evolutionary line leading to our modern species.

The moral capacity we propose for *Homo erectus* depended on all previous innovations. Full-blown religious capacity appears only in our species, *Homo sapiens,* and it depends on *all* the previous evolutionary innovations, including moral capacity. The latter is largely subsumed by religious capacity in today's modern world, so they are separable analytically, but rarely in practice. We summarize these 65 million years of innovations for the reader, here. Note that moral capacity emerges toward the end, and religious capacity, at the very end.

Innovation: Sociality appears in the Order Primates, 65–55 million years ago.
Innovation: Reorganization of the lateral cerebellum occurred in three mammalian orders, including the Order Primates. This provides a basis for cognition.
Innovation: A basic ape model emerged in the mid-Miocene, from 19 million years ago.
Innovation: Realignment of the senses, and upgrades of vision and hearing occurred.

Then, in some groups of our ancestral ape population giving rise to the genera Homo and Pan in Africa, the following happened:

Innovation: There were changes in developmental trajectory, especially secondary altriciality and longevity.
Innovation: A down-regulation of aggression occurred, along with greater social tolerance among adults, especially while feeding.
Innovation: There were upgrades in intellect to manage aggression in social groups.
Innovation: Greater sensitivity emerged, both general and emotional.
Innovation: The biological foundations for culture emerged, evidenced weakly in the genus Pan and strongly in the genus Homo.
Innovation: Aggressive scavenging of meat and a change in niche emerged with *Homo habilis*, 2.8 million years ago (Villmoare et al. 2015).
Innovation: Moral capacity emerged in *Homo erectus*, 1.5–1 million years ago (Rappaport and Corbally 2016a; 2016b).
Innovation: Religious capacity emerged in *Homo sapiens*, stabilizing at 150,000–120,000 years ago (Rappaport and Corbally 2020). To date, religious capacity appears only in *Homo sapiens*, and it incorporates all the previous innovations listed above, including moral capacity (a type of decision making) and the resulting ability to create ethics or moral rules.

2.2. Imaging the Emergence of Ethics in Homo erectus

It is important to be able to image the emergence of moral rules in bands of *Homo erectus*, according to paleobiological facts known about the species. Groups were large in comparison to previous hominoid troop sizes, ranging over one hundred individuals. Consider how complex the social interaction would be among one hundred individuals who lived a rugged, nomadic existence focused on scavenging meat and gathering other foodstuffs. Various age structures have been proposed. Some say the most elderly were forty-five, but others say the age limit was around sixty years old (Carey 2003). Individuals gain substantial experience in sixty years. They have learned a great deal about how the physical and social world works.

Something else happened: The relationships between different-aged individuals changed, with the lengthening of the age span and the advent of adolescence and senility. The relationship between the sexes changed. Sexual dimorphism is strongly reduced in *Homo erectus*. Females, especially if they were pregnant or lactating, needed almost as much food as males (Coolidge and Wynn 2009, 116–118). The previous ape pattern showed much larger males in comparison to smaller females, for example, in the australopithecines – from which the human line apparently did not descend (cf. Kimbel and Villmoare 2016). In *Homo erectus*, it has been proposed, according to the "Grandmother Hypothesis" (O'Connell, Hawkes, and Blurton Jones 1999; Opie and Power 2011), that post-menopausal females helped to nourish their own daughters' children, enhancing the chances that their own genes would survive.

Then, something happened that changed everything. Around 1.5 million years ago, social and cultural life on the evolutionary line to our modern species received an enormous boost that was partially responsible for the rise of moral rules, or ethics: *Homo erectus* learned to control fire. Charcoal hearths have been found farther and farther back into antiquity (Berna et al. 2012). Why are they so important? Because they enabled an interactive context around a common hearth for males and females of various ages who would know each other for long periods of time. The "rule" emerged from their interaction across what we have called "the bright white line" of morality. Philosophers have been more colorful, stating that humans stepped back from "wantonness" (cf. Frankfurt 1971; Korsgaard 2006). It is unusual to see the word "wantonness" in the writing of the social sciences because it feels judgmental. However, crossing that line evolutionarily and neurologically allowed just that: Moral discernment. It occurred through a decision-making process that evaluated facts along a timeline within a value context from "bad" to "good", "unfair" to "just", and "brutal" to "reasonable". Lévi-Strauss (1975) named the difference as that between "the raw" and "the

cooked", which others have interpreted as the "culture-less" and the "culture-affected."

We contend that the Human Hearth encouraged storytelling, ritual, chanting, and even percussion – but not music, which is enabled by a brain organ that was to expand far more in *Homo sapiens* than any of the species' predecessors – the precuneus (Bruner et al. 2018; Cavanna and Trimble 2006; Cavanna 2007). The precuneus is also fundamentally involved in conceptions of the self, comparison of the self to others, and even, we propose, comparison of the self with supernatural deities. Our thesis is that this comparison is the fundamental origin of ethics or moral rules in human groups. They had to originate in a type of species that was intensely social, self-aware, smart, active, and demonstrative. Ethics make no sense for solitary creatures. They make no sense for creatures whose diets are assured, as among many vegetarian herd species. With the advent of the aggressive scavenging of meat in *Homo habilis*, the stage was set for the enlargement of the brain and the capacity to discern morally. The brain enlarged substantially in *Homo erectus*, which caused a further dependence of the group on hunting to obtain sufficient protein. Without the hunting of meat, the energy-hungry brain could never have prevailed. That brain is the origin of ethics.

It is difficult to imagine that one hundred *Homo erectus* individuals of both sexes and various ages could have gathered around a common camp fire and not discussed the successes and failures of the day's search for food, the impetuosity of some young hunter, and the more measured pace of the older hunter, who dealt the final death blow or succeeded in chasing away a competing wildebeest. *Homo erectus* skulls averaged 1000-1100cc in comparison to the brains of *Homo sapiens*, which average 1300-1400cc. These are two different species, but the former was surely evolving into the latter. We contend that morality, an essential component of religious capacity that was to evolve in *Homo sapiens*, appeared first as a foundation in *Homo erectus*. Our species then took moral capacity and incorporated it into every known religion. The two sit together in modern social and cultural life, separable conceptually, but together in practice. This makes ethical thinking organically based, socially based, and culturally based, all at once.

3. Ethics of *Homo sapiens* in the Judeo-Christian Tradition

The two species we have discussed to this point are now understood to have overlapped in time. *Homo erectus* endured in isolation in Java until around 110,000 years ago (Rizal et al. 2019). *Homo sapiens* evolved before that, between 400,000 and 300,000 years ago all over Africa (Hublin et al. 2017), and the species' characteristic globular human skull shape stabilized

150,000-120,000 years ago (Bruner and Pearson 2013). Technically, the two species co-existed, but in very different parts of the globe.

Homo sapiens, our species, went on to express moral capacity in a way that was bound up with religious capacity. We find fully expressed religious capacity only in our species, and not in related species such as *Homo neanderthalensis*, whose line split, after all, with our line around 800,000 years ago, in Africa (Gómez-Robles 2019). Did Neanderthals have some aspects of religious thinking? It is possible, but it is very likely that it was a very preliminary type of religious thinking, in comparison to early humans with full religious thinking. Did Neanderthals bury their dead? Yes, in shallow graves. Did they leave burial offerings? Some say Yes, some say No. The facts are in dispute.

Cognitive archaeologists are now describing the details of Neanderthal social life. They were very constricted socially, interacting in small nuclear families rather than joining other groups for hunting in the pattern of *Homo sapiens* (Wynn and Coolidge 2012; Pääbo 2014). Neanderthals do not leave evidence of the widespread trade routes that are so characteristic of early *Homo sapiens* in Eurasia. They hunted at close range, becoming injured, and lived short life spans. Neanderthal finds seem to show little or none of the reverence that early human graves reflect, to us, their modern descendants, when we try to interpret their meaning. If Neanderthals expressed religious capacity, then we two authors conclude it was weakly.

Therefore, let us leap ahead to humans who did express religious capacity fully, in the variety of early religions of the Holy Land. We see their ability to use religious thinking clearly in the books of the Bible, as well as other books that were written but not included in the Bible, and in the Koran. All these literary sources can be useful while we transition from a prehistorical to an early historical understanding of "ethics." The books of the Bible reveal the prevailing sentiments of the times, 2,000 and more years ago in the Levant. The peoples in that area were beginning to hold firm views about monotheism, i.e., about the existence of a "single god", who eventually became, from a Judeo-Christian perspective, "the one and only God."

We list here some of the attributes of God that are crafted into ethics, i.e., moral rules for how humans should behave. In each of the following examples, there is a transformation of a godly attribute to a rule. For the first attribute, "goodness", there is even a reference to rules or statutes. In "providence", whose translation is now something like the broad protection by God or nature, we see some avenue toward an ecotheological ethic, tailormade for the looming crisis confronting us all now on Earth. The ethics expressed in these verses of the Bible are broad, malleable for the times, instructive for children and adults alike, and very recent in a combined context of prehistory and history. They continue to serve those in the Judeo-

Christian faiths well.

Goodness	"You are good and do good; teach me your statutes" Psalms 119:68
Graciousness	"But you, O Lord, are a God merciful and gracious" Psalms 85:15
Holiness	"You shall therefore be holy, for I am holy" Leviticus 11:45
Love	"Anyone who does not love does not know God, because God is love." 1 John 4:8
Providence	"The heart of man plans his way, but the Lord establishes his steps." Proverbs 16:9
Righteousness	"Whoever practices righteousness is righteous, as He is righteous." 1 John 3:7
Veracity	"God shall send forth his mercy and his truth." Psalms 57:3
Other ethics	"But as for you, O man of God, flee these things. Pursue righteousness, godliness, faith, love, steadfastness, gentleness." 1 Timothy 6:11

In these godly attributes and corresponding ethics reflected in Biblical verses, we see that human theological creativity has crafted attributes of the supernatural into everyday rules for human behavior. The question remains: *Where* in the brain does this happen, and *how* does it happen? There are paths now toward an improved understanding of the neurological "engine" that produces moral rules and applies them routinely every day.

4. Conclusions: Linking a Prehistory of Ideas with the History of Ideas

The new sciences of genomics, neuroscience, cognitive science, and paleoneurology now give us a mechanism to trace the origins of ideas back from history into prehistory. We have mentioned some of the neurological foundations that were evolving so that humans could engage in "religious thinking" and we explore these in depth in Rappaport and Corbally (2020).

The precuneus gives a unique window onto the self, and the self in comparison with other humans and with supernatural beings. The foundations of a navigational sense in modern humans, which is seated in the parietal lobes, gives humans a compass and sense of direction to make our way through both natural and supernatural space (often expressed in religious ritual). The cerebellum gives us internal "models" for the way that things should be, and

the organ checks the quality of models used by the prefrontal lobes. Cautionary tales make more sense to believers. Myths come alive. The fronto-parietal control network allows us to attend to the details of our environment while at the same time we reflect upon what we have done right and what we have done wrong. We can look inward and outward at the same time. The standard decision-making model maps the neural pathways that allow humans to make values-based decisions (Glimcher 2014). Values and the decision-making process itself are reflected in patterns of neuronal changes.

If we can link up our understanding of global concepts like "ethics" or moral rules, and trace the genomics of their appearance, we will be able eventually to see more in our archaeological finds and begin to discover when the remarkable human abilities of moral discernment and moral decision making first appeared. Tracing concepts through time is what the history of ideas is all about. We propose an analogous prehistory of ideas. With modern sciences, we can begin to link our historical understanding to a prehistorical understanding. We are, after all, studying the same species after about 300,000 years ago – us. Before that, there were other members of our genus Homo. They were different from us, but not very much.

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