The Lower and Middle Palaeolithic origins of semiotics

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Abstract.
This paper reviews critically the performance of orthodox archaeology in defining the cultural and cognitive evolution of hominids, and in describing their Pleistocene cultural sequence. It is argued that archaeology has largely failed in this, and has instead sought to focus on the technological and skeletal evolution of humans. It can therefore only provide an inadequate empirical basis from which to speculate about the origins of symbolism. A more suitable basis is established here by revisiting some of the key evidence in any proper consideration of early symbolling, such as beads, engravings, or the introduction of iconicity or language. This leads to the recognition of a significantly longer and slower development of semiotics during the Pleistocene than traditional archaeology has reported. In particular it is noted that there could have been important developments about 900,000 or 800,000 years ago that led to significant changes in hominid communication and cognition, and perhaps acceleration in the evolution of symbolling abilities. These probably involved the ability of creating arbitrary relationships between referrer and referent, the key factor in symbolling. This is therefore where the origins of semiotics are most likely to be found. By the time of the late Lower Palaeolithic, these abilities were probably well advanced, as indicated by the use of beads, engravings and petroglyphs. Such a scenario differs from the traditional view by a time factor of about one to twenty, indicating severe shortcomings in this traditional model.

Introduction

Pleistocene archaeology has consistently failed to deliver what its declared charter was supposed to provide: a cultural history of the human past. It has instead focused largely on creating a history of tool types it had itself invented. Tools, obviously, do not define cultures, they are cross-cultural artefacts. Nor do they define ethnic groups, social groups, tribes, nations or civilizations. Moreover, the tools or other artefacts archaeology names are always etic or arbitrary constructs of 'material evidence categories'; they do not define emic and valid taxonomic entities. Therefore even if diagnostic tools could recognize cultural traditions, it would still have to be doubtful that archaeology could have identified these reliably.

Culture is scientifically defined as the passing on of practice by non-genetic means (i.e. by learning), and is therefore practised not only by humans, but also by many other animals, especially primates. Archaeologists sometimes use the term "cultural layer" to simply describe a sediment layer that contains charcoal, even if it contains no artefacts. There may be no proof that the charcoal in question is anthropogenic, in which case the term is fundamentally misleading. However, even in the presence of such artefacts as stone implements or pottery shards, the term "culture" is not appropriate. In the case of humans, "culture" defines the collective customs, beliefs and arts of a group of people who are usually bound together by it, and these are passed on from generation to generation. It does not refer to tool types; we have no spear culture, knife culture and so forth. Tool types, obviously, exist cross-culturally, and to claim that certain specific archaeological tool types do define specific cultural entities is a case of circular argument. It is also an unfalsifiable proposition, hence not scientific, as indeed are all propositions of archaeology not based on data imported from the hard sciences. For instance, all archaeologically perceived tool types of the Pleistocene are untestable constructs. Similarly, the "cultural sequences" archaeology has provided for the Pleistocene may exist only in the minds and the writings of Pleistocene archaeologists, they may not have any external or emic existence. Certainly they are not testable, which is not to say that they are false, only that they are not scientific.

It is self-evident that hominids did not become human through the natural processes that modified their skeletal architecture, but through processes that enabled them to develop culture, cognition and technology on a scale removing humans far from all other primates in those areas. However, archaeologists and palaeoanthropologists have provided us with a history of the human ascent that focuses very much on the physical evolution of hominids. By comparison, almost no effort has been directed towards learning about their cognitive and cultural evolution. It is therefore quite right to say that the reasons for humanization and the processes involved have so far barely been considered, and most certainly they have not been clarified. Indeed, the preoccupations of the discipline have led to research orientations that are so skewed that it would be unrealistic to expect these disciplines to be able to address the topic of hominid evolution in anything resembling a balanced fashion. In these circumstances, particularly when they are viewed from the perspective of taphonomic logic (Bednarik R.G., 1994a), it seems judicious to regard archaeological narratives of the earliest human past as probably being largely false.

In all fields, not only in archaeology, the dominant and the hegemonic can be both sustained and subverted by narratives (Ewick P. and Silbey S., 1995, p. 200). Narratives frame the world in a struggle for authority; they create ontologies. In the case of the Lower and Middle Palaeolithic periods of human history, the dominant narratives of archaeology are more tenuous, more far-fetched and more invalid than for any other period of our existence as a species. Over the past few decades, the dogma developed for these periods has

become a caricature of archaeological interpretation. In its essence, this dogma perceives no cultural change or evolution throughout the Lower Palaeolithic, roughly from 2.5 million years ago to 180,000 years ago. It defines this time as static, and sees little change even in the subsequent Middle Palaeolithic, which ends 40,000 BP in much of Eurasia, 20,000 BP in Africa and only a few thousand years ago in Australia. Then, with the advent of the Upper Palaeolithic, less than 40,000 years ago, the dogma perceives a cataclysmic 'bottleneck', a 'quantum jump', an 'explosion': all the typically human characteristics that distinguish us from other animals appeared suddenly and at once — and, of course, in western Europe: art, language, complex social systems, self-awareness, forward planning and symbolling. This paradigm draws its inspiration from the 'African Eve' model, according to which all living humans are the descendants of one single female. Her progeny lived somewhere in sub-Saharan Africa in the late Middle Pleistocene, and for unknown reasons became genetically so different that they could no longer breed with other humans. Once they had asserted their intellectual and other superiorities over the neighbouring peoples they began to expand, rapidly taking over the world as they eradicated or displaced all resident populations in Africa, Europe and Asia. Upon reaching Southeast Asia around 60,000 years ago they promptly started building seaworthy watercraft to continue on to Australia. By 35,000 years ago they colonized western Europe, where they wiped out the resident Neanderthals completely and began painting in caves.

This is not, I emphasise, the absurd origins myth of some Californian religious cult. This is what most Anglo-American Pleistocene archaeologists believe actually happened, together with a good number of their colleagues elsewhere who agree with them. And this caricature is what is being taught in the universities of Britain, USA and Australia, among other countries. This model has not one iota of archaeological evidence in its favour, it is based simply on the speculations of some geneticists, opposed by other geneticists. Bearing in mind that the genetic divergence times based on unknown mutation rates and population sizes are dubious (Barinaga M., 1992; Templeton A.R., 1993, 1996; Ayala F.J., 1996; Brookfield J.F.Y., 1997; Pennisi E., 1999; Strauss E., 1999), to say the least, it would appear that the formulation of the African Eve model was a simple misunderstanding. The geneticists tailored their supposed mutation rates and other unknown variables to suit such emergence times for modern people they had been given to understand were reasonable, while the archaeologists assumed that the geneticists themselves had the correct numbers. Neither side effectively realized that the other was only guessing. In reality, population sizes as well as mutation rates and other crucial variables are entirely unknown, and the divergence times given have no credible independent basis at all. In short, the African Eve model is probably the result of a misunderstanding.

In asking questions about the capacities of early hominids, such as those concerning the origins of symbolling, one therefore has to contend with a most unsatisfactory archaeological record. A great schism has in recent decades developed in our concepts of hominid evolution. It concerns the antithetical positions of the "long range" and the "short range" theories of the cognitive development of humans. Sometimes called the "gradualist" and the "discontinuist" models (d'Errico F. and Nowell A., 2000), these two diametrically opposed conceptions perceive two entirely different paths of non-physical human evolution. The short-range model rejects all evidence of symbol use prior to 40,000 years BP, insisting that it commenced as part of the claimed cognitive revolution at the beginning of the Upper Palaeolithic. In the last few years the resolve of its protagonists has begun to wane somewhat as they have made first concessions and are tinkering with some aspects of their theory, but it still remains the dominant model.

The long-range model perceives a gradual evolution of language, art-like productions, advanced hunting methods, shelter building, garment making, social complexity, and of course the symbol use which drove most of these developments. This gradual evolution occurred over vast time spans well before 35,000 years ago, and some of it was already underway around a million years ago. The evidence for the long-range model consists of a panoply of material finds which, sadly, the short-range protagonists are uniformly unfamiliar with (Bednarik R.G., 1992, 2003a). When confronted by individual finds that challenge their model they try to explain them away, or regard them as a "running ahead of time" (Vishnyatsky L.B., 1994), or pronounce them as untypical, or challenge their dating or the scholarly competence of their promoters. This is a familiar pattern in Pleistocene archaeology, dating back to the times of de Perthes and Pengelly, the "incompetent amateurs" who discovered the Palaeolithic in the early 1800s, as well as to the later, similarly "incompetent" discoverers of fossil man, Pleistocene art and *Homo erectus*, and many more scholars since, all of whom were persistently rubbished, ridiculed and persecuted by orthodox archaeology. This alone should be sufficient reason to distrust establishment archaeology, the system of a discipline whose practitioners are trained, licensed and employed entirely by the state. There is thus nothing new in the present confrontation, it is an ancient issue of an inadequately informed discipline that tries to rely on its lack of falsifiability to resist change. When it perceives itself to be under attack, as it does rather often (from renegade archaeologists, amateurs, indigenous people, science commentators), it closes ranks and reverts to dogma. It behaves like a belief system, like a religion (Freeman L.G., 1994).

In examining the very beginnings of symbolling we therefore have to make an initial choice: to follow either the long-range or the short-range model. With the latter, the answer is relatively simple: there is no use of symbolism before the advent of the Upper Palaeolithic, where its origin is fairly transparent. According to I. Davidson and W. Noble (1989), the answer lies in the introduction of figurative or iconographic imagery. The transference of the meaning of a word was only possible

after a picture of the object had been drawn. So in a nutshell, the process was like this: one drew a bison, pointed to it and said "bison", and that is how language began. Clearly, then, depiction had to come before language, and symbolling began with it.

Davidson and Noble's hypothesis of language origins is not qualitatively different from those others we have seen appear and disappear since the 19th century. They include the infamous 'bow-wow', 'ding-dong' and 'heave-ho' theories, and they became so rampant in Europe that in 1866 the Société de Linguistique de Paris banned the topic altogether from its meetings and publications. As incredible as it may sound, Davidson and Noble's explanation was not only proposed and published in a prominent journal, it was even taken serious by a discipline steeped in short-range explanations, and was widely accepted. In fact Davidson was so encouraged by its reception that he soon announced that all humans prior to fully modern man should be placed with the apes rather than hominids (Davidson I. and Noble W., 1990). These follies may be entertaining to peruse, but the question to be asked here is this: in investigating the origins of symbolling, should we waste any time in considering the possibility that the short-range theory could have gotten it right, or should we simply move on?

I have written enough about this trivial program and its many mistakes to be most reluctant to pursue the matter yet again, and I take the liberty of suggesting that the long-range theory is the only one to be considered here. I will now review what I consider to be key aspects of any serious discussion of the origins of human symbolling abilities, beginning with the complex issue of iconicity.

Iconicity

Iconicity is the property of a marking or shape that provides visual information recognised by most contemporary humans as resembling the form of an object. A marking or object (referrer) is considered iconic when most modern people tend to see it as resembling a different object (referent). However, iconic resemblance of a referent is not self-evident, its detection requires an appropriate perceptual mechanism. Visual ambiguity, from which this facility probably developed (Bednarik R.G., 2003b), is a property widely experienced by species throughout the animal kingdom, but it is thought that only hominids developed a cultural use of this feature. The experience of perceiving, for an instant, a snake on a forest path when in fact there is only an exposed tree root is an example of visual ambiguity, which seems to prompt an alert-reaction caused by a neuronal template. Such visual misidentification, my theory predicts, could in an organism capable of "conscious" reflection lead to perceiving a connection between referent and referrer (or the signified and the signifier). In this theory, the actual production of iconographic forms becomes the cultural and intentional creation of features prompting visual responses to a signifier; *it induces visual ambiguity intentionally*. This definition of art is crucial in effectively understanding the nature and origins of iconographic art, but it is also crucial in understanding hominid cognition and symbolling.

In iconic symbolism, the connection between referent and referrer is via iconicity. This is a relatively simple form of symbolling, in the sense that an organism capable of cognitively perceiving visual ambiguity detects at least some meaning without any cultural faculties coming into play. The cognition involved is deeply rooted in mental processes found in numerous animal species, such as flight reactions to the silhouette of a bird of prey or to eyes on the wings of a butterfly. It is even related to the effect of camouflage, which is just as widespread in natural systems. Some animal species master iconic recognition, in the sense that they recognise a likeness in a photograph or film. Thus symbolism based on iconicity is cognitively much more rudimentary than a symbolism requiring the link between referent and referrer to be negotiated culturally. For instance, a bead is an object that can have exceedingly complex symbolic roles, but its meaning is only accessible to an organism possessing the software of the cultural conventions concerned.

The acoustic or phonetic equivalent of iconicity is onomatopoeia, which refers to the formation of words by imitating a sound associated with the referent. Typical onomatopoeic words are 'cuckoo' or 'buzz'. With them the meaning is either obvious, or detecting it requires only minimal cultural (learnt) faculties.

In much the same way there are forms of modified iconicity: natural forms whose iconic qualities have been emphasized by anthropic modification. This observation leads to a fundamental differentiation between three forms of symbolism in palaeoart: iconic, modified iconic, and non-iconic. The most direct is by iconicity of purely natural, i.e. unmodified forms. It occurs when an object of the natural world offers sufficient visual clues to prompt the mental bridge to be made between referent and referrer. In palaeoart we have two typical representatives: manuports such as the Makapansgat cobble (Bednarik R.G., 1998) or the Erfoud Site A-84-2 cuttlefish fossil cast (Bednarik R.G., 2002), which are of such powerful iconic properties that they were noticed by hominids up to three million years ago (Figure 1). Such objects attracted sufficient curiosity to be collected and taken back to occupation sites. The ability to detect such strong levels of iconicity is certainly not very far beyond the capability of the higher pongids, such as chimps or bonobos, so it is reasonable to expect them in australopithecines and subsequent hominids, such as *Kenyanthropus platyops* (3.5 Mya). The second early representative of possible direct iconographic symbolism is via fossil casts, of both floral (e.g. ferns) and faunal specimens (Feliks J., 1998). Fossils are a prime example of a class of natural forms offering many, if not most, of the visual characteristics of the referent (the live organism, in this case). It seems very possible that hominids benefited cognitively from making the connection between referrer and referent in such relatively obvious cases. This could have prompted the establishment of neural pathways permitting the

understanding that one thing can stand for another, as well as the appreciation that the objects of the object world can be grouped into classes on the basis of taxonomic criteria. These two abilities were among the most important cognitive milestones in human evolution, therefore they need to be investigated most thoroughly. In my considered view, both appeared at about the same time, and it is hardly a coincidence that their appearance was accompanied by an apparent quantum jump in technological capacities.

Figure 1. *The Makapansgat jasperite cobble under the microscope. It was deposited in a dolomite cave almost 3 million years ago, having been collected some distance from the find site.*

Symbolling of the Lower Palaeolithic

These crucial steps in "becoming human" occurred not, as the "short range" archaeologists would have it, 40,000 years ago, they become evident between one million and 800,000 years ago. It is at that time that hominids apparently began to discriminate between "exotic" articles and "ordinary" ones (Bednarik 1990a). It is also then that they left the very first evidence of one of the most important indicators of symbolling, the use of pigment (Bednarik 1990b, 1992, 1994b). This coincides roughly with the expansion of humans into Europe, presumably via the Strait of Gibraltar (Bednarik 1999a); it probably coincides with the domestication of fire, and certainly with the introduction of seafaring in Wallacea, Indonesia (Bednarik 1999b, 2003c). The last-mentioned, in particular, tells us a great deal about the developing symbolling ability of humans, and in more ways than one. One of the most sophisticated symbol systems developed by our species is of course language, and it is widely agreed that maritime navigation and colonization of lands by seagoing vessels presupposes fairly complex communication forms, almost certainly of the verbal kind. Since Pleistocene seafaring necessarily involved forward planning and coordinated community efforts (Bednarik R.G. and Kuckenburg M., 1999) it is almost impossible to account for it in the absence of "reflective" language (Davidson I. and Noble W., 1989). But there are even more relevant incidental effects. Seafaring is the earliest example we have in hominid history of the domestication of multiple natural systems of energy. It uses the combined effects of waves, currents, wind and buoyancy, and it remains the most complex utilization of energy systems throughout the Pleistocene period. Until the inventions of wheel and sledge it also remained the only mode of assisted locomotion used on this planet ("assisted" in contrast to autonomous locomotion, as in walking, running, crawling or swimming). It would have promoted the formation of new neural structures on a scale not seen hitherto, such as those supporting "conscious" awareness of cause-and-effect relationships. This, too, has neurobiological implications for symbolling abilities.

Figure 2. *The quartzite proto-figurine from the Middle Acheulian of Tan-Tan, Morocco, perhaps in the order of 400,000 years old.*

Still other abilities seem to be evident from these developments. For instance, the need for forward planning (it is widely assumed that seafaring was initially based on the use of bamboo, which needs to cure for several months after it is harvested) implies that concepts of time were a shared social reality, probably reified in

some communicable form. Other technologically suggested variables refer to the need for cordage, and thus for knotting, without which no form of simple watercraft (almost certainly types of rafts were involved) can effectively be constructed.

Cordage is of course also necessary for other, more complex indicators of symbolism, beads and pendants. But before we move on to such non-iconic symbols, we need to consider an intermediate mode. Subsequent to the recognition that some natural forms can resemble other objects so closely that they can be symbolic for them, a hominid with tactile skills and a good deal of experience in tool use would eventually be tempted to modify such iconic objects to emphasize their iconicity. The oldest finds we have currently of such evidence are the proto-figurines of Tan-Tan (Bednarik R.G., 2003b) and Berekhat Ram (Goren-Inbar N., 1986), thought to be roughly 400,000 and 300,000 years old respectively (Figure 2). The practice of modifying natural objects to emphasize some iconic quality has persisted ever since, it can be found through the succeeding periods of the Palaeolithic and it can still be found today. In a scientific sense it is a subtle management of visual ambiguity: the characteristics of an iconographically already ambiguous object are intentionally accentuated.

This is not to say that symbolling and intentionally modulated communication were the result purely of the factors so far visited. Others are likely to have contributed, and here I would especially like to emphasize the possible involvement of re-enactment, or what is called theatre. To appreciate the role of its symbolism we can easily imagine the return of a successful hunter who revisits his triumph by re-enacting how he stalked the prey, how he slew it. His narrative behaviour in camp would have elicited only bewilderment among his band if they had not shared with him the appropriate neurobiological structures enabling the comprehension of the symbolism he relied upon. In other words, his audience had to possess the facility of discriminating between referrer (his performance) and referent (the hunt he attempted to recreate), while at the same time understanding the symbolic bridge between the two. One could further speculate that symbolling by re-enactment is likely to have originated from neuronal pathways facilitating deceptive behaviour, which has been observed in chimps. Once again we see that symbol use is based on neuronal circuits that may well have their antecedents in those of earlier primates. It is therefore inappropriate to expect finding a specific development or event that would mark the beginning of symbolling. Rather, this must be assumed to be an incremental process, with its origins deep in unconnected neuronal structures that existed even before humans appeared (Fiedler L., 2003). It was apparently during the Lower Palaeolithic that, in a sequence of developmental events that still need to be identified, various strands or fragments of behavioural traits came together in such a way that what we call “consciousness” became possible. The extremely fragmentary evidence of some of these developments has been hinted at above, but some important components of the archaeological evidence have yet to be described.

About beads and engravings

The possible existence of Acheulian beads has been known for as long as evidence of a Palaeolithic period has been detected. J. Boucher de Perthes (1846) discovered not only the co-existence of Pleistocene fauna and humans (for which he was ridiculed and attacked by archaeologists for decades), he also noticed the occurrence of *Coscinopora globularis* fossils together with the handaxes of the Acheulian of the Abbeville region of northern France. Both he and Marcel-Jérôme Rigollot as well as J. Prestwich (1859) recognized that on many of these fossils, the central tunnel was apparently widened with stone tools. Yet their discovery, as well as the similar observations by W.G. Smith (1894, pp. 272–6), remained ignored by the archaeologists of the entire 20th century. This was remedied only in October 2003 when I located 325 *Coscinopora globularis* specimens in the collections of the Pitt Rivers Museum in Oxford. Most of them originate from Lower Palaeolithic deposits in northern France and southern England (Figure 3). I subjected them to detailed microscopic examination and, to my amazement, discovered that several dozen of them bear distinctive wear facets around their perforations. These wear traces are unmistakeable evidence that these beads were worn on strings, and many of them were so extensively worn that they must have been used in this fashion for many years, even decades in some cases. Moreover, many of the specimens bear, as de Perthes had correctly noted, traces of flaking where the blocked central tunnel opening had been enlarged, clearly by human hand and clearly intentionally.

Figure 3. *Stone beads from the Acheulian of the Abbeville region in northern France, of unknown age.*

This evidence is crucial to understanding not only the cognitive capacities of Acheulian people, but also to considering the beginnings of symbolling. Beads and pendants are among the most obviously symbolic objects we can ever expect to find from the Pleistocene. They tell us a great deal about both the technology and the culture of their makers and users. Technologically they illustrate not only the ability to drill through brittle or very hard materials, such as teeth, but also they imply the use of cordage. The very essence of a bead or pendant is

to be threaded onto a string; it would simply be pointless to perforate a small object for another purpose but to pass a string though it. However, the use of cordage also suggests the use of knots, because a string needs to be closed to form a loop to be effective. Although the ends of a string may be joined by means other than a knot, e.g. by the use of adhesive or by plaiting, these alternative means are either impracticable or they are technologically even more complex than the use of knotting (Warner C. and Bednarik R.G., 1996). The diachronic availability of Pleistocene remains of cordage (Leroi-Gourhan A., 1982; Nadel D. et al. 1994; Pringle H., 1997) is of no relevance to the question, because that class of material evidence obviously possesses an exceptionally high taphonomic lag time (Bednarik R.G., 1994a). In short, what beads tell us about the technology of the people who used them is well in excess of deductions concerning their manufacture.

More important, however, are the cultural and cognitive deductions they make possible. Beads can be used in a number of ways or for several purposes: they may be emblemic, for instance, and provide various forms of information about the wearer and his or her status in society. Availability for marriage, political status and state of mourning might be such possible symbolic meanings. At one level one might believe that beads indicate simply body adornment, but this is almost certainly an oversimplification. Even if vanity were the motivation for wearing such items, stating this explains not why such items are perceived as 'decorative'. The concept itself is anthropocentric; we do not assume that other animals perceive the information imparted by the beads as meaningful. In human culture, however, various forms or levels of meaning may be encoded in such objects, as well as in other kinds of body adornment (tattoos, body painting, cicatrices, infibulation, anklets, armbands etc.). In ethnography, beads sewn onto apparel or worn on necklaces may signify complex social, economic, ethnic, ideological, religious or emblemic meanings, all of which are only accessible to a participant of the culture in question. To illustrate with just one example: beads or pendants may function as charms; they may be a means of protection against evil spells or spirits.

Such explanations are of course not archaeologically recoverable, but in rare cases the specimens themselves proving symbolling ability are. Beads of the Lower Palaeolithic are available not only from the French and English Acheulian, but also from sites in Austria, Libya and Israel (Bednarik R.G., 2001). It is therefore inexcusable that they have been consistently ignored by archaeology for more than one and a half centuries. This alone provides enough reason to ignore the models of orthodox archaeology in considering the origins of symbolling. Yet there are still three more types of evidence to be considered here. They are graphic iconic depiction, non-iconic surface markings and the use of colouring material. Oddly enough, the last-mentioned, which is the weakest of the three, is the one that has attracted the most sustained effort (for recent review, see Hovers E. et al. 2003). Evidence of pigment use, especially of iron oxides and hydroxides, has been tendered for several decades in the support of symbol use, but it needs to be cautioned that it is not necessarily conclusive proof. Mineral pigments such as haematite, goethite and ochreous materials could conceivably be used for utilitarian purposes, although this not common ethnographically and perhaps unlikely for the Lower Palaeolithic. The likelihood that these pigments were used for symbolling activities (body painting, colouring of artefacts, colouring of rock surfaces) is much greater. Nevertheless, in proposing symbolling we are on safer ground with intentional engravings, be they on portable objects such as those of bone, ivory or stone, or in the form of petroglyphs on rock.

Concerning the latter, the most outstanding candidates are cupules — hemispherical depressions hammered into sometimes very hard rock surfaces, usually in groups, sometimes occurring in huge numbers. This archaic form of rock art is found in all continents except Antarctica, accounting in each of them for the oldest known kind of rock art but also occurring in numerous more recent cultural traditions. The oldest examples currently known date from the Acheulian (Bednarik R.G., 1993) or are thought to do so (Kumar G., 1996; Kumar G. et al. 2003). They occur in a few Indian quartzite caves or rockshelters, notably Auditorium Cave and Daraki-Chattan. However, there is a good possibility that similar material in South Africa might be of a similar Lower Palaeolithic antiquity (Bednarik R.G., 2003a). The domination of very early rock art by these cupules is very probably a taphonomic phenomenon, therefore it tells us not very much about these palaeoart traditions or their range of expressions. Nevertheless, they are important to the origins of symbolling because there can be no question about either their intentionality or their semiotic status. Their manufacture was highly labour intensive and they have no utilitarian function whatsoever.

Not so free of controversy is the issue of the portable non-iconic engravings found in many pre-Upper Palaeolithic contexts. The "short-range" protagonists have consistently sought to reject individual finds by questioning the intentionality of engraved grooves, or by repudiating that they had been made with stone tools. In a number of cases their scepticism was indeed justified, but the tendency of extrapolating from them stifled the study of symbol origins greatly. The two main objections were that, among the many examples of pre-Upper Palaeolithic engravings, there were no recognizable motif templates, and that there were no repeated patterns. Both of these objections have now been refuted, in fact at a single site. Oldisleben 1, a site of the Eem geological period north of Weimar, Germany, belongs to the eastern Micoquian. Together with a distinctive stone tool tradition dating broadly from between 135,000 and 80,000 years ago, three engraved bone fragments were recovered (Bednarik R.G., 2004). Two of them bear series of sub-parallel grooves made with such precision and under such conditions that their intentionality cannot realistically be questioned (Figure 4). The third, on the fragment of a shoulder blade, bears the engraving of an

iconographic image. This is the oldest picture found so far, and it destroys yet another cornerstone of the archaeological dogma, according to which iconic graphic art older than 40,000 years would never be found. It has been found now, and more of it will be found in the future. The traditional model of art origins is therefore refuted and Pleistocene archaeology is ready for a paradigm shift.

Figure 4. *Bone fragment with two sets of sub-parallel lines engraved with stone tools, from the Oldisleben 1 site, Germany, of the Micoquian, and possibly in the order of 120,000 years old.*

Discussion

We have thus arrived at a position diametrically opposite to that of the "short-range" advocates. Symbolling did not commence with the advent of the Upper Palaeolithic in Europe, but at least twenty times as long ago. Even the traditional sequence of emerging symbolic capabilities is to be discarded. Apart from the need to become much more circumspect in our pronouncements about this sequence, nothing seems quite as straightforward as a simplistic Darwinist model of gradually increasing complexity would predict. What we can say with some level of credibility is that precursors of symbol use that helped to prime the neural system of hominids did so already more than a million years ago. A number of developments occurred perhaps a million years ago or soon after, which implies that symbolic systems had a massive impact on the lives of hominids. They led to significant cognitive and social changes permitting colonization across sea barriers, and to other forms of domesticating natural systems. These included fire use, probably modification of domestic environments by shelter construction, and no doubt first use of clothing by a tropical primate colonizing temperate and eventually even cold regions. It is during the final Early Pleistocene and the first part of the Middle Pleistocene that hominids can be shown to have started to collect rock crystals and fossils, and used red pigments. Most certainly by that time, around 900,000 or 800,000 years ago, language-like communication was used effectively. A few hundred thousand years later, symbolic objects began to be modified. Proto-figurines and engraved plaques occur, followed by beads and pendants. Markings were now produced on various types of surfaces, including probably on rock, and a very few of them managed to survive to the present, under particularly fortunate preservation conditions. Some time later, but still in the Lower Palaeolithic, rock markings took on such forms that some of them also managed to survive. At this stage, we have to expect a kind of culturally very differentiated society, about as complex as some of those observed ethnographically. But this is still long before *Homo sapiens sapiens* emerged, it is still during the reign of the archaic sapiens hominids, whose perhaps most extreme form are the Neanderthals. By the advent of the Upper Palaeolithic, a mere 35,000 or 40,000 years ago, it was all over. The complexity of symbolling, social systems and cognitive faculties was essentially identical to what is available to us today. By that time, people wove textiles and created master paintings we stand in awe of.

This is the kind of scenario we need to consider if we seek to find the origins of symbolling. On the basis of current evidence, the most crucial period, the time when hominids commenced a trajectory delivering them to where they are today, was the late part of the Early Pleistocene. By the time of its end, 780,000 years ago, the course had been set for our species, at least in terms of its fundamentals. More cannot be said at this stage, because the conditions for making more confident pronouncements simply do not exist. They are lacking because archaeology, in looking for these developments, has completely failed to come to terms with its errors, having looked essentially in the wrong places, and in the wrong era of human history.

The ability of creating arbitrary relationships between referrer and referent is perhaps the most defining characteristic of humans. Archaeology has consistently ignored this, has focussed largely on its invented tool categories, and has therefore failed to provide a cultural history of humans. Symbols are the most powerful driving force that made humans human. They are abstract, often society-specific constructs of reality aspects. Especially those detectable visually are physical fragments of human interpretation of the physical world. Their full meanings are only interpretable within the social contexts that created them, even in the case of iconographic symbols, but most especially in those that lack iconographic anchor points. The proper study of this vast body of evidence, called palaeoart, has not yet begun. Perhaps it will begin in this century. And perhaps it will, some time, lead to an understanding of how humans created their reality out of chaos.

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This paper was first published in *Structural and Semiotic Investigations in Archaeology*, ed. Alexander Yevglevsky, in 2006.

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