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INTERPRETING THE EVIDENCE FOR ART ORIGINS

Introduction

For much of the 20th century, the question of art origins has been considered only within one frame of reference: the supposedly Upper Paleolithic portable art and rock art of Europe, especially south-western Europe. Extremely ancient art forms from the remaining continents were treated in only the most cursory fashion, and not considered at all by many authors. This has led to a mythology centering on the cave art of south-western Europe, and to the false models of the origins of human language, human self-consciousness and human cognition which we have witnessed for the past hundred years.

Recently the credibility of much of what has been claimed about European Upper Paleolithic rock art has come to be questioned. The main factors of the present crisis in Paleolithic art studies are perhaps the following eight:

1. The traditional stylistic dating has been discredited by scientific dating in many cases and is no longer acceptable. More specifically, the reliable dating of paintings in Chauvet Cave (Clottes et al., 1995) renders all stylistic sequences of Paleolithic parietal art irrelevant, including those of Breuil and Leroi-Gourhan.

2. Stylistic parameters themselves are being questioned, and particularly their simplistic correlation with sometimes subjectively perceived, etic stone tool traditions.

3. The identification of depicted objects, including animal figures, has been questioned and has been shown to be unscientific and subjective. It cannot be tested by Popperian logic.

4. The introduction of taphonomic logic (Bednarik, 1994a) has been found to have significant effects on most interpretations of the relevant evidence.

5. Consistent problems with lack of relevant knowledge about important available data have been pointed out repeatedly.

6. The problems with fakes, suspected fakes and archaeological misidentifications continue to plague the archaeological study of paleoart, particularly in Western Europe (Bednarik, 1994b).

7. The pronounced geographical bias in paleoart studies throughout the last century render the existing record distorted and many hypotheses based on it practically irrelevant.

8. The frequent identification of Holocene rock art across all of Eurasia as being of the Pleistocene suggests underlying structural problems with the identification of 'Paleolithicity' in rock art.

Each of these classes of problems represents significant obstacles to a scientific study of paleoart, but collectively they indicate an alarming situation. The selectiveness in what is, and what is not considered in this context, the fairly self-evident dating dilemmas, the tenuous state of stylistic claims concerning any aspect of archaeology, and the continuing taphonomic illiteracy of the discipline show us that the archaeological investigation of paleoart over the 20th century has been a failure.

The still dominant model of art origins has paleoart first appear in south-western Europe about 32,000 years ago. According to some, this coincides with the appearance of language and 'modern human behaviour'. I have consistently opposed this model for many years.

The most rigid opponents of pre-Upper Paleolithic paleoart are those arguing for a very late introduction of language, and those who favour the straight replacement hypothesis of archaic *Homo sapiens* throughout the world (the proponents of the 'African Eve theory'). After I pointed out that the Middle Paleolithic sailors who reached Australia at least 60,000 years ago must have had language to achieve this, my opponents conceded this point and modified their hypothesis: now the first landfall in Australia became the earliest proof of language use. But this only demonstrated their ignorance further, because we have known for four decades that *Homo erectus* crossed the sea repeatedly many hundreds of millennia ago (Bednarik, 1997a). The evidence was published in a series of about ten papers between 1958 and 1972, but it remained unknown in the English-speaking world until 1995. On the basis of the criteria of my opponents, human language is at least 840,000 years old.

In exactly the same way the claims that language appeared with the advent of the European Upper Paleolithic are attributable to a lack of knowledge by archaeologists, as are their claims that there is no paleoart before 32,000 years ago. So is the frequently voiced claim that we have only a few questionable human burials and occasional use of ochre to indicate any earlier non-utilitarian behaviour. Similarly, the claims that body decoration, notably beads and pendants, are an innovation of the Upper Paleolithic are as false as the claims that barbed harpoons, underground mining or pigment use are so too.

I have described hundreds of instances of contrary evidence, so here I will only very briefly review some key finds and focus on the earliest time period, the Lower Paleolithic. Evidence of ochre or haematite use extends back to perhaps 800,000 years ago, and is quite common by 300,000 BP in the three continents then occupied by hominids. This includes pieces that were used crayon-like to mark rock surfaces with. Of similar age is the apparent collection of quartz crystals, fossil casts and other exotic items, which continues right through the Pleistocene. The oldest known proto-sculptures (Bednarik, 2003a), a modified quartzite stone from Morocco and a modified scoria pebble from Israel, are also of the dominant stone tool tradition of the period, the Acheulian, and are dated between 500,000–233,000 BP. Similarly, the oldest known rock art, consisting mostly of cupules, is of the Acheulian, and continues through the subsequent Mousterian (Bednarik, 1995). Around 300,000 years ago appear the first incised portable objects we know about, consisting of extinct animal bone fragments and stone plaques. The earliest known perforated objects, presumably used as pendants, are also thought to be several hundred thousand years old, and there are many more from the subsequent periods. For instance, ostrich eggshell beads of about 200,000 years age have been excavated from the Acheulian of the Sahara, and much older beads fashioned from fossil casts occur in at least three countries (Bednarik, 2003b).

Beads cannot be invented and then manufactured in some cultural vacuum. Clearly they demand the existence of a social context within which symbolism has quite specific functions. Nobody would seriously entertain the idea that small circular, centrally perforated and repeatedly produced objects of ostrich eggshell were anything other than 'decorative' beads, whatever their actual use or purpose may have been; or that animal canines perforated near their root were used as pulling handles or quangings or weights of some kind.

But such objects can also tell us a great deal about the technological capacities of the people who fashioned them, and even about the societies that provided a meaningful context in which such products may have been objects of symbolism. For instance, both beads and pendants can function only in conjunction with the use of strings of some type: without them, it is entirely senseless to embark on the very difficult process of perforating a tooth. Moreover, the use of cordage and beads demands, for all practical purposes, the use of knots, because without them it is almost impossible to join the ends of a string to prevent the loss of the beads. In fact, joining the ends of a string without the use of knotting is technologically even more complex than the use of knots, so we can reasonably deduce the use of both strings and knots from the presence of beads and pendants. In any case, seafaring also postulates the use of cordage, and it predates the known use of pendants by a considerable time span.

Perhaps the most important deduction such objects as beads and pendants permit us relates to the cultural system they demand. Irrespective of whether beads indicate vanity, ethnic or personal identity, social or political status, they convey complex emblemic or social information about the wearer, which it would be impossible to create a context for without the use of a communication system such as language. We have many other indicators of possible language use during the Lower and Middle Paleolithic (e.g., other forms of symbolism, or successful ocean navigation), and the very early use of beads and pendants provides similarly crucial evidence which, collectively, renders the until now dominant model of cognitive evolution superseded.

Taphonomic logic

The concept of taphonomy was established by the Russian paleontologist J.A. Efremov of the Soviet Academy of Sciences (1940). It is the study of the processes affecting evidence whose condition may be a function of time

(as in geology, paleontology, archaeology and so forth), determining its present appearance, characteristics and statistical properties. The concept was introduced in archaeology during the 1980s but its application there remains limited. Its introduction in rock art research led to the development of an axiomatic form of logic based on the idea of taphonomy, and called taphonomic logic (Bednarik, 1994a).

It is quite clear that disc beads made from ostrich eggshell are a form of artifact that would not have been made in very small numbers by any one of the societies that used them. Their role would have always been non-utilitarian, ideological, emblemic or symbolic. To provide them with a social meaning it would have been essential that they were made in quite large numbers, because it is usually repeated and 'structured' use which confers meaning on symbolic artifacts. Even a single wearer of such jewelry is likely to have worn a number of the beads in order to achieve a decorative effect, and not just one specimen. However, the actual number we have of Middle Pleistocene beads, just a few hundred, is still minute. These occurrences are profoundly unconnected geographically, and to interpret their occurrence without recourse to their taphonomy is archaeologically invalid.

This brings us to the all-important subject without which the interpretation of the earliest evidence of paleoart is entirely irrelevant. No archaeological event can have a survival probability of either nil or 100 %. This establishes the concept of taphonomic lag time, which is the time between the point when a phenomenon class was first introduced, and the advent of its frequent occurrence in what is called the 'archaeological record'. The taphonomic lag time can range from below 1 % to above 99 % of the phenomenon's historical duration, depending on the type of evidence that may survive of it. So for instance it is much longer for objects made from wood than for objects made from stone. However, in no form of evidence can the taphonomic threshold, which is the point in time from which the evidence occurs frequently, coincide with the first occurrence of the type of event it is thought to relate to.

For most forms of archaeological evidence, taphonomic lag is very substantial. For instance, in the case of watercraft, it is about 99 % of the phenomenon's actual duration. We have no material evidence of watercraft use before 9000 BP (Star Carr, Holmgaard 9000 BP, Pesse 8020 BP). Between 8000 and 6000 BP the number of such finds increases rapidly, and after 6,000 BP we have of course Egyptian and other material. Thus the chronological distribution would form a classical parabolic curve, as taphonomic logic demands (Bednarik, 1994a: fig. 2). The taphonomic threshold point coincides with the early Holocene. However, we have indisputable evidence of several sea crossings going back at least 840,000 years. This is a classical case of an extremely long lag time.

Rock art corpora are highly susceptible to taphonomy. Depending on regional differences in lithology and climate, rock paintings become common worldwide in the very final Pleistocene or early Holocene, especially with the advent of Mesolithic technologies in Eurasia. Any earlier rock paintings are preservational flukes that survived only under exceptional conditions (e.g., in deep caves or under silica skins). This is where we need to look for their taphonomic threshold, and since rock paintings would have a very long taphonomic lag time, we must assume that the first application of paints or dry pigments must have occurred long before the Upper Paleolithic. The statistical and logical tools for actually quantifying this form of logic are rather complex, but they have been demonstrated mathematically (Ibid.).

Petroglyphs probably have a shorter taphonomic lag time, and large corpora of them also seem to appear earlier in time. In fact the overwhelming majority of rock art motifs of the Pleistocene have to be expected to be petroglyphs. The largest corpus of Pleistocene rock art is in Australia and belongs entirely to a tradition of Middle Paleolithic typology (*sensu* (Foley, Lahr, 1997)). Even among the minute evidence predating the respective taphonomic threshold, petroglyphs clearly predominate, and they provide all known rock art in the world prior to about 32,000 BP.

In summary, the production of paleoart commenced several hundred thousand years ago. Taphonomic logic demands that, for most of this time, only very rare evidence should be found, spatially and temporally unconnected and isolated, and this is precisely what the record provides us with. The illogical explanation of some archaeologists, that these 'unexpectedly early' finds indicate a 'running ahead of time' in cognitive and technological evolution (Vishnyatsky, 1994), is perhaps the greatest single theoretical mistake ever made in Pleistocene archaeology.

Paleoart of the Lower Paleolithic

Paleoart of the Lower Paleolithic period has been found for well over 150 years but it has remained largely ignored, misinterpreted or at least controversial. The currently available credible evidence of symbolic or non-utilitarian behaviour from the Lower Paleolithic is summarized here. Material evidence of this kind is defined as 'paleoart'; whether or not this constitutes 'art' in the modern accepted usage of that term is irrelevant. The primary issue is that this material is crucial in considering the cognitive and intellectual status of the period's hominids. The relevant evidence can readily be divided into a few groups: small perforated objects that

were probably used as beads or pendants, petroglyphs, indications of pigment use, figurines, engravings on portable objects, and unmodified objects that are thought to have been carried around because of some outstanding physical property (manuports).

Paleoart finds of this earliest time of symbol use are still exceedingly rare, and among those that have been reported some are of doubtful status or have fairly been rejected. The evidence presented here has been culled from a much greater corpus of reported finds. It consists of specimens that constitute either convincing evidence of symbolism, or that provide such compelling aspects that they deserve to be seriously considered in this context. I have examined many of the crucial specimens myself and their listing here indicates that I accept their authenticity after careful analysis. In the cases where reasonable reservations are appropriate I will try to present these fairly.

Beads and pendants

It is well known that the existence of Paleolithic culture was first demonstrated by Jacques Boucher de Crèvecœur de Perthes (1788 – 1868). But it was soon forgotten that with the 'handaxes' and animal remains he and Marcel-Jérôme Rigollot excavated at Abbeville and St. Acheul, they also found a large number of fossilized sponge fragments with central perforations (*Coscinopora globularis*), which may or may not be manuports (Boucher de Perthes, 1846). Rigollot considered them to have been used as beads (Prestwich, 1859: 52), while Prestwich himself, who also found some specimens, remained undecided but did note that some of the holes appeared to have been enlarged artificially. Because the pieces found no further attention, they had been forgotten by the time Smith (1894: 272 – 276) excavated about 200 identical items from an Acheulian site at Bedford, England. These were of precisely the same species and also showed artificial enlargement of the natural orifice. Smith was certain that these specimens were used as beads, which in view of the identical French finds from the same period is indeed likely. Keeley (1980: 164) examined some of the English sample and confirmed that there is no doubt that their perforations were modified. Goren-Inbar et al. (1991) recovered similar disc-like and perforated fossil casts from an Acheulian site, Gesher Ya'aqov in Israel, although these are crinoid segments (*Millericrinus* sp.) and no evidence of modification was noted. I conducted a microscopic examination of 325 of the French and English *Coscinopora globularis* specimens and found that many were indeed significantly modified (Bednarik, in press (a)). Moreover, I found that many of them bore distinctive wear facets around their openings, indicating that they were worn over a long period of time while threaded on a string. I therefore regard their status as beads as reliably demonstrated (Fig. 1).

What renders the possibility that these finds were used as beads even more plausible is the discovery of clearly made disc beads from a Late Acheulian site in Libya, El Greifa (Ziegert, 1995; Bednarik, 1997b). According to Th/U dating and other evidence, these ostrich eggshell beads are about 200 thousand years old, and my replication experiments have shown that their manufacture involved a complex procedure. Originally, only three damaged specimens were found, but more have become available since. Furthermore, there can be no doubt about the authenticity of two pendants from the Repolust Cave in Styria, Austria (Bednarik, 1992, 1997b). Their perforations are clearly anthropic, but since their discovery (Mottl, 1951) they have attracted almost no attention. A drilled wolf incisor (Fig. 2) and flaked bone point were recovered together with a large lithic assemblage variously describes as Levalloisian, Tayacian and Clactonian, probably a late Lower Paleolithic industry. It was found well below an Aurignacian level, separated from it by substantial clastic deposits of stadial periods. No reliable dating is available from the site, but according to the regionally well-known paleontology, especially the phylogeny of the bears, the occupation seems to be in the order of 300 ka old.

Petroglyphs

Whereas some (though certainly not all) of the bead-like finds might invite alternative explanations or could be explained away as unusual coincidences, this uncertainty does not apply to petroglyphs whose anthropic origin has been demonstrated. Petroglyphs relating to Middle Paleolithic traditions are very common, in fact they are more common than Upper Paleolithic rock art (Bednarik, 1995: 628). The number of petroglyphs credibly attributed to the Lower Paleolithic period remains relatively small, but it must be remembered that nearly all examples refer to discoveries of the last decade.

The first rock art ascribed to the Acheulian are the eleven petroglyphs in Auditorium Cave, Bhimbetka complex, Madhya Pradesh, India (Bednarik, 1993a, 1994c). Nine cupules (cup marks) occur on a large vertical boulder face above ground level, while a tenth cupule and a meandering groove clearly associated with it were found in an excavation, covered by the uppermost part of substantial Late Acheulian occupation deposits. They were overlain by a horizon of heavily calcite-cemented Middle Paleolithic sediment that virtually excluded the possibility of post-depositional disturbance. The cave is formed in heavily

Fig. 1. Beads of fossilized sponge fragments from the Acheulian of Biddenham quarry at Bedford, England.

metamorphosed quartzite, a rock of such hardness that it was extensively quarried by Acheulian hominids at several Bhimbetka sites.

Another Indian quartzite cave, Daraki-Chattan, was found to contain two vertical panels densely covered by 498 cupules (Kumar, 1996). Because apparently Middle Paleolithic and Acheulian lithics occur on the surface of the cave's floor deposit, it was suggested that these cupules might be of great age as well (Fig. 3). Similarly, two further cupule sites in Rajasthan, of exposed boulders and in a further quartzite shelter, were also considered to be of great antiquity, although here the evidence remains circumstantial (Kumar, Sharma, 1995). In response to these discoveries I established the Early Indian Petroglyphs (EIP) Project, with the intention of testing these claims by an international panel of specialists (Bednarik, 2000, 2001a; Kumar et al., 2003). As part of the EIP Project, major excavations were commenced at Bhimbetka and Daraki-Chattan in 2002. This led to the excavation at the latter site of numerous exfoliated wall fragments found within the Paleolithic occupation deposit. These rock slabs bear a total of about twenty further cupules, identical to those on the walls above, and more such finds are expected from the still incomplete excavation. Stone tools exhibiting Lower and Middle Paleolithic characteristics were found above and together with these slabs, in a deposit that is considered undisturbed. OSL (optically stimulated luminescence) dating of the deposit at Daraki-Chattan and at two Bhimbetka sites is in progress.

While some Indian sites thus present the currently oldest known rock art in the world, there are also three southern African finds that need to be considered here. First, there is the phonolite cobble M.D. Leakey (1971: 269, pl. 17) reported from Floor FLK North 1 in Bed 1, Olduvai Gorge. The 10.5-cm specimen is artificially grooved and pecked, bearing what appears to be one cupule on each side. Perhaps its Plio-Pleistocene antiquity precludes interpretation as a paleoart object,

Fig. 2. Wolf incisor from Repolust Cave, Austria, perforated at its root.

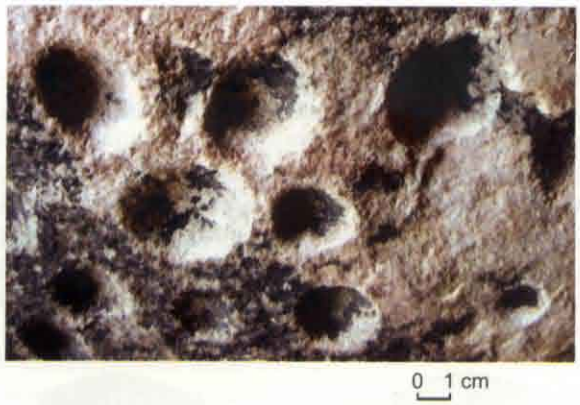

Fig. 3. Cupules on vertical quartzite wall in Daraki-Chattan Cave, India, of the Acheulian.

perhaps it was utilitarian. Nevertheless, the possibility that these pecked depressions are particularly early cupules should not be discounted a priori (Fig. 4).

A second find in that general region that needs to be mentioned here is a grindstone of the Fauresmith industry bearing a partly pecked grid pattern. It was reported by Laidler (1933) from Blind River Mouth in East London, South Africa. The Fauresmith, characterized by small

well-made handaxes, is a Late Acheulian industry in the interior of southern Africa, and Peter Beaumont (personal communication) thinks the assemblage excavated with this object is in the order 400 ka old.

In 2001, Beaumont discovered a series of very early cupule sites in the Korannaberg region of the southern Kalahari. Like very early Indian cupules, they occur on a particularly hard quartzite, so hard that most of the stone implements found at the sites were made from it. These artifacts belong generally to the Middle Stone Age (ca 120 ka), the Fauresmith (ca 400 ka) and the Acheulian (older still). Beaumont's find has yet to be investigated in detail, and in the context of very early rock art it certainly deserves further attention.

Pigment use

Petroglyphs of the Lower Paleolithic may still be comparatively rare phenomena, but evidence of the use of iron oxides and hydroxides, presumably as coloring matter, has long been demonstrated from many sites in the Old World. Finds of haematite and similar minerals that bear striation use-marks are known from several occupation sites of this period, in various parts of Africa, Europe and India (Bednarik, 1992, 1994d).

Wonderwork Cave in South Africa provides some of the earliest relevant evidence, because its numerous ochre fragments occur at all levels down to bedrock, the lowest of which are thought to date from the early Middle Pleistocene (Imbrie et al., 1984; Beaumont, 1990, 1999; Binneman, Beaumont 1992; Bednarik, 1994b). Much older still are the two lumps of 'ochre' L.S.B. Leakey (1958) has reported from the Developed Oldowan of Olduvai BK 2, Tanzania, but they were subsequently identified as red volcanic tuff (Oakley, 1981: 207) and are questionable evidence. A haematite piece from Kabwe Cave near Broken Hill, Zambia, is probably in the order of 300 ka old, and there is a spheroid stone of 60 mm with red staining from the same site to be considered as well (Clark et al., 1947). Clark (1974) also reports evidence of pigment use from the Acheulian site at Kalambo Falls, Zambia, which is probably around 200 ka old. Somewhat older than that is a more recently found, definitely ground piece of haematite from Nooitgedacht, South Africa (Beaumont, Morris, 1990). The red pigment traces on the Tan-Tan figurine from Morocco also need to be considered in this context, even though they are only microscopic, but at around 400 ka they do represent the earliest evidence of applied pigment that we currently have (Bednarik, 2001b, 2003a).

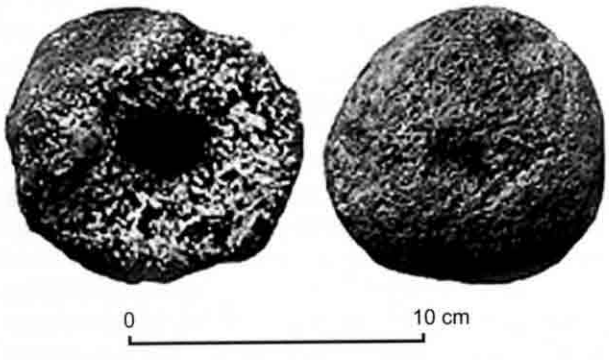

Fig. 4. Cobble from Olduvai Gorge, bearing a cupule on each side (after (Leakey M.D., 1971)).

All these finds are isolated instances, whereas the more recent Middle Stone Age has long yielded major quantities of iron pigments in southern Africa, including quite extensive mining evidence (Stapleton, Hewitt, 1928; Beaumont, Boshier, 1972; Beaumont, 1973; Miller et al., 1999; Grün, Beaumont, 2001; Henshilwood et al., 2001, 2002). However, recently the quantity of such material from the Lower Stone Age of sub-Saharan Africa has been increased significantly, and with it the evidence of use in the form of striation facets. This includes more than seventy red ochre pieces, over 5 kg in weight, from site GnJh-15 in the Kapthurin Formation, Kenya, >285,000 years old (McBrearty, 2001: 92). More than 306 pieces of specularite, haematite, limonite, ochrous sandstone and manganese dioxide have been excavated at Twin Rivers, Zambia, dated to between 270 and 170 ka BP (Barham, 2002). Of particular importance is that 3 % of this material shows signs of modification by grinding or rubbing.

This confirms the actual use of ferruginous pigment during the Lower Paleolithic period, first demonstrated by Marshack (1981) in Europe and by myself in Asia. Marshack has reported a 33-mm haematite piece from the Acheulian of Bečov, Czech Republic, striated on two faces. The floor near this find was covered by pigment powder, suggesting an activity of manufacturing coloring powder at this site. Among a series of almost twenty haematite pebbles found in the Acheulian layer of Hunsgi, India, one 20-mm specimen bears a distinct facet with sub-parallel striations indicative of its use as a crayon to color a rock surface (Bednarik, 1990). We cannot know what these color markings may have looked like, but the mere evidence that they must have been made raises the possibility that there was some form of pigmented rock art. A few European Acheulian sites had earlier yielded tentative evidence of ochre use, including Terra Amata, France, where several apparently facetted fragments were noticed among 75 pieces of red, brown and yellow, fire-treated limonite deposited about 380 ka ago (Lumley, 1966). A reportedly shaped slab of ochre was also found in the Acheulian of Ambrona, Spain (Howell, 1966: 129), and a 'rubbed' haematite fragment from Achenheim, France, seems to be about 250 ka old (Thévenin, 1976).

These finds imply that pigments have been in use for much if not all of the Middle Pleistocene of southern Africa, and elsewhere in the Old World for at least much of the second half of that period. Ochre and similar minerals can be used for body painting, for the painting of objects (as indicated in the Tan-Tan figurine) or to draw on surfaces, notably on rock. All of these activities demand complex cultural practices and probably the use of symbolism.

Proto-figurines

The existence of figurines in the Lower Paleolithic has only recently been seriously considered and we currently have only two specimens that appear to deserve the designation 'figurine'. This requires evidence that the specimens are not just iconic, in the sense that they resemble another object they are seen to represent, there must also be an indication that the object was modified by human hand so as to emphasize that iconicity.

A basaltic tuff pebble containing scoria clasts was excavated from a large occupation deposit of the Late Acheulian at Berekhat Ram, Israel, and is older than 230 ka (Goren-Inbar, 1985). Its natural form, suggestive of the head, torso and arms of a female human, has been emphasized by man-made grooves implying that the iconic properties of the object were appreciated (Goren-Inbar, 1986; Goren-Inbar, Peltz, 1995). Most commenting authors rejected the find in the subsequent years without examining it (e.g., (Chase, Dibble, 1987; Davidson, 1990; Pelcin, 1994; Noble, Davidson, 1996: 75; Davidson, Noble, 1998)). Marshack (1996, 1997) conducted a microscopic study of the object's markings, concluding that the grooves and abrasions were made with stone tools. His main findings were corroborated by d'Errico and Nowell (2000). They accepted the object's artifact status, but they still queried the significance of its iconicity even though they called it a 'figurine'. Another issue of continuing concern was the unique status of the Berekhat Ram object.

Both these issues were resolved a year later with the report of a second stone figurine from the general Mediterranean region. The object from Tan-Tan, Morocco, is of quartzite and comes from a Middle Acheulian occupation layer thought to be about 400 ka old on the basis of the lithic typology (Bednarik, 2001b, 2003a). Its anthropomorphous form is much more pronounced than that of the Israeli specimen and is emphasized by eight symmetrically arranged grooves (Fig. 5). Five of these lines were found to have been modified and microscopic traces of a brilliant red pigment seem to indicate that the figurine had once been coated by red paint.

Engravings

The archaeological community remains divided over the status of the several engraved objects reported from the Lower Paleolithic. The largest site assemblage is the one from Bilzingsleben, a major occupation site (more than 1000 sq. m excavated) of the Holstein Interglacial in Germany (Mania D., 1991). This biface-free industry of well over 100,000 stone tools has been found together with numerous skeletal remains of either *Homo erectus* or very robust archaic sapienoids (at roughly 300 ka probably the latter). This lake-side living site has yielded six apparently engraved bone fragments, mostly of the forest elephant, and one on a quartzite slab (Mania D., Mania U., 1988; Bednarik, 1988, 1993b, 1995). It is widely accepted that the grooves found on these specimens were made with the points of stone tools, but some commentators have considered them to be incidental results of utilitarian activities. However, the D-shaped marking on the stone slab shows repeated application of a tool to master its difficult curved part. While most of the other engravings are merely groups of linear grooves, those on the first four bone objects reported have been demonstrated by lasermicroscopic analysis to have been made intentionally (Steguweit, 1999). I have shown that five of the bundled sub-parallel grooves on bone object No. 3 were all made with the same stone tool (Bednarik, 1988), and the rectangular arrangement on a metatarsal elephant bone is far too complex to be incidental (Bednarik, 1995: 609). Moreover, it resembles the engraved rectangular pattern on a 77-ka-old Blombos Cave haematite slab (d'Errico et al., 2001) and even similar Upper Paleolithic finds. These and other factors negate the attribution of the marks to utilitarian activities. Finally, one of the three engraved bone fragments from gravel pit Oldisleben 1, Thuringia (Germany), found with a Micoquian industry and Eem fauna (Bednarik, in press (b)), displays markings almost identical to those on the No. 1 object from Bilzingsleben. This scapula fragment bears two distinctly intentional sets totaling almost twenty engraved parallel lines, arranged in the same manner as those on the Bilzingsleben specimen (Fig. 6). These and other consistent features in the earliest known paleoart suggest that even in these remote times, conventions that are definable as 'traditions' already existed (Bednarik, 1995; Hodgson, 2000).

The status of a similarly marked elephant bone from another central European hominid site, Stránská skála in the Czech Republic (Valoch, 1987), remains to be clarified, although it does resemble the marking strategies of other very early finds. The lines on a fragment of an ox rib, Acheulian, Pech de l'Azé, France (Bordes, 1969; Marshack, 1977), are in all probability natural phenomena. However, the anthropic authenticity

Fig. 5. Middle Acheulian quartzite figurine with modified grooves, Tan-Tan, Morocco.

of an engraved bone fragment from the Acheulian of Sainte Anne I, France, which bears ten short cuts along an edge, seems assured (Crémades, 1996). This probable horse bone from near Polignac in the Haute-Loire region is remarkably similar to the German fragment of a mammoth tusk from Whylen near Lörrach. The latter bears a series of about twenty short, obliquely cut notches, arranged linearly and so evenly spaced that they seem to be notational (Moog, 1939). The age of the ivory fragment is not known but as it was excavated in a Rissian loess it is probably of similar antiquity as the French specimen, belonging to the late Lower Paleolithic (Fig. 7). Finally, Wonderwork Cave in South Africa has yielded two fragments of banded ironstone bearing sets of curved sub-parallel lines incised with stone tools. They are from a late Fauresmith context dated to between 420 and 260 ka (Imbrie et al., 1984), and are thus of an antiquity matching that of the Bilzingsleben finds in order of magnitude.

With about a dozen credible specimens at our disposal, the case for Lower Paleolithic engravings on portable objects remains tenuous. But the consistencies among these finds, particularly in the marking strategies employed (Bednarik, 1995; Hodgson, 2000), demand their serious consideration. There are some distinctive patterns: the markings, clearly made with stone tools, appear to be responses to the shape of the available facet area in most instances. Only two of the marking sets seem to be randomly arranged. Nearly all of them show apparently deliberate spacing of individual marks, and other indications of purposefulness are present. Bearing in mind that the use of coloring material is safely demonstrated from the late Lower Paleolithic, and that in some cases crayons were used to mark rock surfaces by stroking, it should be a reasonable expectation that such marking of surfaces was also attempted by abrasive or cutting action. Such action was widely used in the utilitarian technology of the period, as we know from its wooden artifacts.

Manuports

Unmodified objects collected, transported and deposited by humans or hominoids can be identified when they occur in occupation deposits in which they could not possibly occur naturally. Another distinctive characteristic of manuports is that they are not just exotic objects, they possess some outstanding visual or material properties that are presumed to have prompted their acquisition. The collection and cultural use of exotic objects is not limited to hominids, it can for example be observed in various bird species.

The earliest reported manuport dates from the very beginnings of hominid phylogeny, being almost 3 Ma old. Until recently it was attributed to *Australopithecus africanus* but the discovery of *Kenyanthropus platyops* (3.5 Ma) offers another possibility. The Makapansgat jasperite cobble was excavated in 1925 from the fossiliferous, australopithecine-bearing breccia 3 of the dolomite cave Limeworks, Makapan valley, South Africa (Eitzman, 1958; Dart, 1974). Its history was

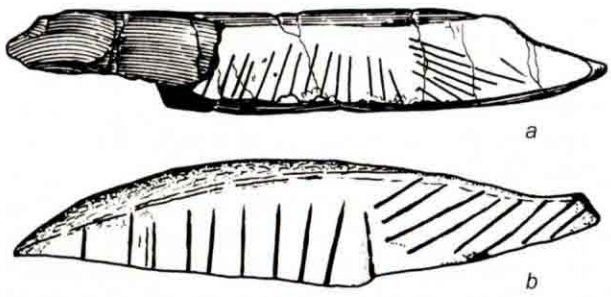

Fig. 6. Comparison of two engraved bone fragments from Germany, one of those from the Lower Paleolithic of Bilzingsleben (*a*), and one of those from the Micoquian of Oldisleben 1 (*b*).

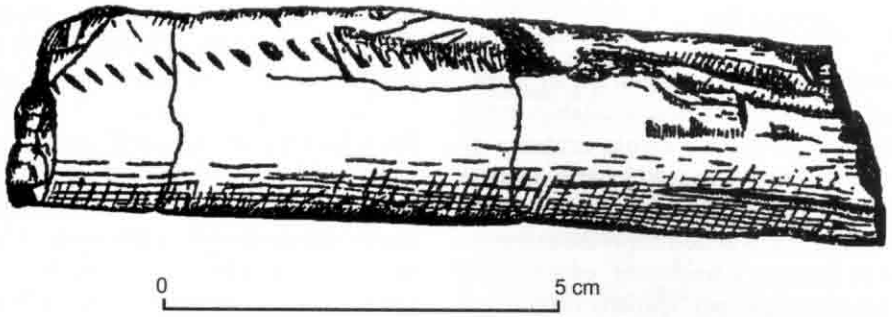

Fig. 7. Rissian ivory tusk fragment with series of engraved notches from Whylen, Germany.

reconstructed by microscopic study of its surface markings and accretions (Bednarik, 1998). The distinctive markings of the cobble, especially the most prominent 'eyes' and 'mouth', seem to have prompted its collection at least several kilometers from the site, either by australopithecines or by some of the earliest hominids (Fig. 8).

This find remains entirely unique, but clear prismatic rock crystals are a more common form of manuports at early occupation sites. They are sometimes so small that they could not possibly have served any utilitarian purpose, their obvious visual properties seem to have attracted curiosity. Rock crystal prisms occur in all Acheulian occupation layers of Wonderwork Cave, the lowest of which have been suggested to be about 900 or 800 ka old (P. Beaumont, personal communication). The Lower Acheulian site Singi Talav in India has yielded six complete and unmodified quartz prisms ranging only from 7 – 25 mm. They differ mineralogically, which suggests that they originate from different crystal flowers and were probably brought to the site independently (d'Errico et al., 1989). Even smaller quartz crystals were excavated from the Acheulian layer of Gesher Benot Ya'aqov, Israel (Goren-Inbar et al., 1991). Zhoukoudian in China provided about twenty more quartz crystals, and here they occurred with *Homo erectus* remains (Pei, 1931: 120). The fragment of a large clear rock crystal was excavated in the Acheulian layer of the Gudenushöhle, Austria, together with several smaller fragments of this glass-like material (Bednarik, 1992).

Oddly enough, the most-cited specimen of a Lower Paleolithic evidence of 'symbolic cognition' is a handaxe from West Tofts, Norfolk (Oakley, 1981). While it is quite possible that the well-preserved fossil cast on its surface was noted by the maker of this artifact (Feliks, 1998), this is not at all possible to demonstrate. Fossil casts occur occasionally in all sedimentary silicas, and there is a statistical probability that such a feature can appear on a large stone tool without intentionality having to account for this.

Similarly, the anthropomorphous dolomite piece from Mumbwa Caves, Zambia (Barham, 2000), may well be a manuport, but until it is shown to have been either introduced or modified by hominids its status remains to be clarified. Dated to Oxygen Isotope Stage 5e, it was found in debris associated with the foundations of a windbreak. This brings to mind the identical context of the Erfoud manuport from Morocco, which was found within the outline of a Late Acheulian windbreak or dwelling structure (Bednarik, 1992). This fossil cast of *Orthoceras* sp. is distinctively reminiscent of a human penis in every aspect of form, size and surface texture. Cuttlefish fossils are very common in other parts of Morocco, but they do not occur naturally in the region of the find site, so this is also a Lower Paleolithic manuport.

Fig. 8. Jasperite cobble manuport excavated in Makapansgat, South Africa, Pliocene.

Discussion

It has thus become clear that recognition of three-dimensional iconic resemblance was available in the Lower Paleolithic. We now have ample evidence of ochre use in the Middle Pleistocene, which may include the application of pigment to rock surfaces. Moreover, the portable engravings of this period imply the existence of distinctive if rudimentary traditions, especially a marking behaviour one might call 'spatially determined doodling', which is still present in the subconscious of humans today. The even more distinctive behaviour that created the cupules of the Acheulian, and later of the Middle Paleolithic from France (La Ferrassie) to Australia, also survived to historic times. In the face of this evidence it is no longer reasonable to continue denying that paleoart traditions already existed in the Lower Paleolithic. The use of beads and pendants, which seems to be demonstrated at least for the late part of that period, certainly implies the existence of complex social systems, because without such a context these purely symbolic products could not possibly have had any meaning or purpose.

These observations indicate that we have severely misjudged the cognitive and cultural competence of early humans. We now accept that hominids such as *Sahelanthropus tchadensis* may have begun their reign 7 Ma ago, and almost 3 Ma ago a hominid found the Makapansgat cobble sufficiently interesting to carry it around (Bednarik, 1992). Not only is it entirely reasonable to expect the hominids of the Middle Pleistocene to have developed this curiosity a little further with time, it is simply absurd to expect that almost no cognitive evolution should have occurred in hominids for 7 Ma. The view that this was followed by an immense 'explosion' in their cognitive faculties during the last third of the Late Pleistocene, i.e. the last 0.5 % of the duration of hominid evolution, is similarly absurd. Yet this is what paleoanthropology and archaeology have favoured over the last few decades, especially in the Anglo-American school of archaeology. The record indicates otherwise, and it tells us also that hominids have been seafarers since the late Early Pleistocene, i.e. for about 1 Ma (Bednarik, 1999, 2001c; Bednarik, Kuckenburg, 1999). Consequently the discontinuist or short-range model of human evolution (i.e. the 'African Eve model') that has dominated recent discussions is almost certainly false. It is much more probable that the increase in cognitive competence occurred gradually, over a long period of time, perhaps roughly reflecting the increase in cranial capacity over the same period. This applies also to language or speech, most certainly available to the first mariners, and to other fundamentally human capacities such as the creation of concepts of reality, concepts of self, and the acquisition of non-utilitarian systems facilitating advanced cultural and social constructs. All of this developed long before the advent of the people who now regard themselves as the pinnacle of evolution, *Homo sapiens sapiens*.

The traditional view in archaeology that Lower Paleolithic hominids lacked human cognitive capacities is refuted here by the presentation of a large series of finds from that period, indicating that it gave rise to discernible traditions of paleoart production. While the number of specimens of each find category remains inadequate to determine details of the processes of art origins, distinctive patterning in their mode of occurrence and in the forms of this evidence facilitates the formulation of initial hypotheses. Accordingly, the earliest surviving paleoart consists principally of linear engravings organized by very basic conventions, unstructured groups of cupules and minimally modified iconic proto-figurines. Of particular importance to the issues of cognitive evolution and self-awareness are beads and pendants, whose occurrence in the Lower Paleolithic leaves no doubts that these hominids possessed conventions of symbolism. Moreover, this class of evidence also demands the existence of sufficiently advanced social structures to give rise to such complex conventions as those demanded by the use of beads.

All of this evidence fundamentally contradicts the traditional paradigm, and taphonomic logic provides a comprehensive explanation of why Pleistocene archaeology has almost completely misinterpreted the evidence. Rather than the Lower Paleolithic being a period of minimal cultural evolution, it was a period of momentous changes and cognitive developments that set the course for all that followed. Archaeology has thus largely misinterpreted the processes of humanization. Hominids became humans not through physical changes of their skeletal architecture, nor through their development of stone tools, which are the two areas almost exclusively considered until now. Hominids became humans by developing the capacity of creating constructs of reality and of the self. The evidence for these developments has so far not been studied in any consistent fashion, but such a methodology is likely to develop in the course of the present century. It can only develop outside of traditional archaeology, which in two centuries has shown itself singularly incapable of effectively tackling the issues of cognitive hominid evolution.

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