

The earliest known palaeoart

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Abstract. The available global evidence of palaeoart is reviewed comprehensively, continent by continent. For each world region, petroglyphs as well as rock paintings are considered, also engraved portable art, sculpted portable art, and other forms of evidence that have been suggested to be the result of non-utilitarian activities. The result of this review shows that simplistic and outdated models of the beginnings of art, and indirectly of human consciousness, language, culture and cognition, are now superseded. This applies particularly to Eurocentric models, and to those postulating a very late development of these various faculties. Notably, the model of art origins emphasising the role of south-western Europe in the Upper Palaeolithic, so dominant throughout twentieth century archaeology, is no more than a fond self-delusion of inadequately informed scholars. Art-like productions begin with the Lower Palaeolithic in three continents, and are extensively documented from the Middle Palaeolithic of four continents. Of particular significance is the massive corpus of essentially Middle Palaeolithic Pleistocene rock art of Australia, which may be hundreds of times the size of Europe's Pleistocene rock art body, but which has so far been ignored in all such considerations. Finally, it should be of great concern that all the stylistically inspired chronological sequences of Upper Palaeolithic European rock art created during the twentieth century have been shown to be largely if not entirely false, as are the claims of its specialists of identifying such stylistic or chronological entities.

Introduction

The question of the beginnings of art have long been recognised as being crucial to our understanding of the origins of human language, human consciousness, human culture, as well as the development of modern human cognition. More importantly still, that question is thought to be intimately related to the formulation of past and present human concepts of reality. In this sense, the entire framework of our epistemology is ultimately predicated on the development of non-utilitarian human culture, and its interaction with our faculties of perception (Bednarik 1994a). The processes responsible for these developments remain very poorly understood. This is at least in part because of false models archaeology has provided in the past. In particular, throughout the twentieth century, the topic of art beginnings was entirely dominated by just one model: that relating to the Upper Palaeolithic rock art and portable art of Europe, particularly Western Europe.

Only very recently has this model come under sustained and coherent attack, particularly with the promotion of earlier art evidence from other continents (Bednarik 1994b, 1994c), and the trend towards explanations of taphonomic nature to account for the composition of the surviving evidence (Bednarik 1994d, 1995a, 1995b). The emerging picture differs dramatically from the old model and it is the topic of this paper.

To explore the possible scenarios of cognitive hominid evolution, a variety of evidences have been proposed to have relevance. The most relevant corpus of evidence in this quest is the body of very early palaeoart at our disposal, and any other evidence that may provide clues to early hominid cognition. This 'other' evidence may include objects that suggest non-utilitarian functions, or technologies that seem to have required certain minimum mental capacities, such as seafaring which first occurred in the Lower Palaeolithic period (Bednarik 1997a). 'Palaeoart' itself is a collective term describing all art-like manifestations of the distant past.

Claims for extremely old rock art (in excess of 30 000 years BP) have been made for almost all continents, the notable exception being North America, besides Antarctica where there is no rock art at all. The evidence as it stands will be summarised for each continent, of what has either been claimed to represent particularly early use of symbolism, or what in the author's view should be considered in such a context. In each case petroglyphs as well as pictograms will be considered, engraved portable art, sculpted portable art, and other evidence that has been suggested to be the result of non-utilitarian activities.

North America

Dorn and Whitley (1984) have obtained a series of cation-ratio minimum dates from Coso Range (California) petroglyphs ranging up to about 11 500 years BP, but numerous writers have rejected the method's reliability (Bednarik 1988a; Bierman and Gillespie 1991; Bierman et al. 1991; Watchman 1989, 1992) and Dorn (1997) himself has now withdrawn his results. Similarly, the datings at Salton Sea (Lake Cahuilla), California (Turner and Reynolds 1974), and at Long Lake, Oregon (Ricks and Cannon 1985), have all been questioned. Loendorf's (1986) attempt to date what he thought to be a rock painting at the petroglyph site Rochester Creek, Utah, has been refuted (Bednarik

1987a). Early petroglyphs at Mud Portage, Lake-of-the-Woods, Canada (Steinbring et al. 1987) have been shown to be between 5000 and 9000 BP, and petroglyphs of another Canadian site were recently minimum dated to 3500 BP (M. Aubert, pers. comm.). Nevertheless, Pleistocene petroglyphs may well exist in North America (Bednarik 1994e; Parkman 1992). Useful dating information for North American rock paintings has been provided by Russ et al. (1990) and subsequent papers by the team from Texas A&M University.

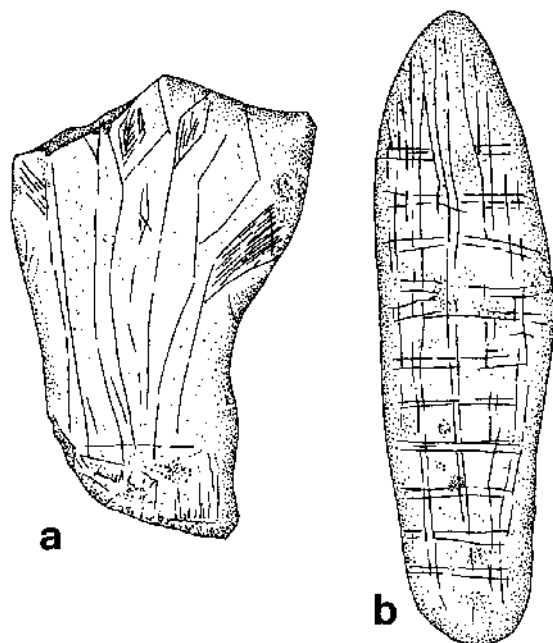


Figure 1. Two Clovis limestone plaques, engraved on both sides, site, Texas.

There is no shortage of apparently Pleistocene portable art objects from North America, but most have been exposed as fakes. The only exceptions (apart from beads from the Jones-Miller site in Colorado) seem to be a mineralised sacrum from Tequiquiac, Mexico, which has been modified to look like an animal head (Bahn 1991: Pl. 18a), and two limestone plaques from the Clovis layer of the Gault site, Texas (Figure 1). Other examples are less well authenticated, but a bone with an engraving of a rhinoceros from Jacob's Cave, Missouri, has been suggested to be of the Pleistocene (Bahn 1991: 92).

South America

The principal claims of Pleistocene antiquity for South American rock art refer to the important sandstone shelter Toca do Boqueirao do Sítio da Pedra Furada, Piauí, in north-eastern Brazil, where human occupation traces extend beyond 40 000 years BP (Guidon and Delibrias 1986; Parenti 1993). However, it is unlikely that any of the extant paintings in this site could be older than the final Holocene (Bednarik 1989). At Toca do Baixao do Perna I, another of Guidon's sites, the paintings are at least 10 000 years old (Bednarik 1989: 105). They occur immediately above a thick layer of charcoal. A fragment of a pigment ball that showed signs of having been worn as an ornament was found at the site, providing an AMS radiocarbon date of $15\,250 \pm 335$ years BP (Chaffee et al. 1993).

Figure 2. Early petroglyphs in Epullán



Grande Cave, Argentina.

'Archaic' petroglyph traditions occur also in South America, including in southern Piauí. The motifs are heavily patinated or weathered and often occur together with accumulations of extremely archaic-looking stone tools, for instance in Brazil (Bednarik 1989) and Bolivia (Bednarik 1988b). Their motif range, and that of early petroglyph sites in North America, is typically non-figurative and resembles that of archaic petroglyphs of other continents (Bednarik 1987b). Recently, reliable age evidence has been secured from one site in Argentina and several in central Bolivia, which indicate that petroglyphs were produced there at least since the end of the Pleistocene, and probably earlier. A minimum age of 9970 ± 100 seems to apply to linear grooves in Epullán Grande Cave, western Argentina (Crivelli M. and Fernández 1996) (Figure 2). A series of sites in the Mizque valley and near Cochabamba, Bolivia, produced several microerosion age estimates ranging through the Holocene (Bednarik 2000).

Asia

There have been several claims relating to Upper Palaeolithic rock paintings in central India, championed especially by Wakankar (1983); similar claims from Siberia (Okladnikov 1977); and claims of portable engravings from the early

Upper Palaeolithic of China (You 1984) and South Korea (Sohn 1981). An examination of many Asian claims of Palaeolithic art has invalidated the overwhelming majority of them (Bednarik 1992a, 1993a, 1993b, 1994c; Bednarik et al. 1991; Bednarik and You 1991; Bednarik and Devlet 1992).

In Siberia, finds of portable art have been reported from about twenty sites (Abramova 1990; Bednarik, 1994c). It has been argued that the mere depiction of a mammoth does not constitute proof of Pleistocene antiquity of the art in Siberia (Bednarik 1993c), although the Mal'ta plaque (Bednarik 1992a: Fig. 3) is likely to be around 14 000 years old. This has recently been confirmed at Ignatiev Cave (Steelman et al. 2002). However, nearly all known Asian (as well as eastern European) graphic art of the Pleistocene is non-figurative (Bednarik 1993d). Siberian portable art includes the probably oldest presently known iconic sculpture, an animal head from Tolbaga, thought to be possibly 35 000 years old. Siberian claims of Pleistocene rock art, however, have been seriously questioned. A few painted motifs among the many thousands of rock paintings and petroglyphs on the upper Lena, Siberia, were identified as being Palaeolithic by Okladnikov (1959: 22-41; cf. Okladnikov and Saporoshskaya 1959), a finding that is frequently cited in the literature (e.g. Abramova 1962; Ksica 1973, 1984). Yet there is no evidence for this dating and the art is probably all of the late Holocene (Bednarik 1992b; Bednarik and Devlet 1992).

In neighbouring China there are many examples of dating rock art to the Ice Age by perceived species (Gai 1986: 415-24; Li 1992; Liu 1991; You 1984; Chen 1991: 126; cf. Tang 1993 and Wang 1984). At the present time, no rock art in China has been shown to be of the Pleistocene. No portable art from China was known until some years ago, except the material from the Upper Cave of Zhoukoudian: haematite lumps, perforated teeth, pebbles and shells, and five tubular bone sections with parallel cut marks (Bednarik and You 1991). In 1991, a beautifully engraved piece of antler was reported from a limestone cave north-east of Beijing, Longgu Cave (Bednarik 1992c). Being about 13 065 years old, the object remains the only known evidence of art from the Chinese Palaeolithic (Figure 3).

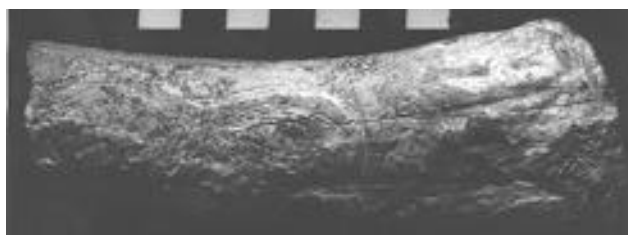


Figure 3. Engraved antler fragment from the Upper Palaeolithic of Longgu Cave, China. This is the only such evidence presently known from China.

The only available evidence of Pleistocene art in Japan comes from the cave of Kamikuroiwa, where several engraved natural pebbles were found in a layer dated to about 12 000 BP. Some of their marks have been interpreted as depicting breasts and skirts (Aikens and Higuchi 1982). In addition there are a few apparently non-utilitarian stone objects known from the Japanese Palaeolithic, including a perforated specimen (Bednarik 1994c).

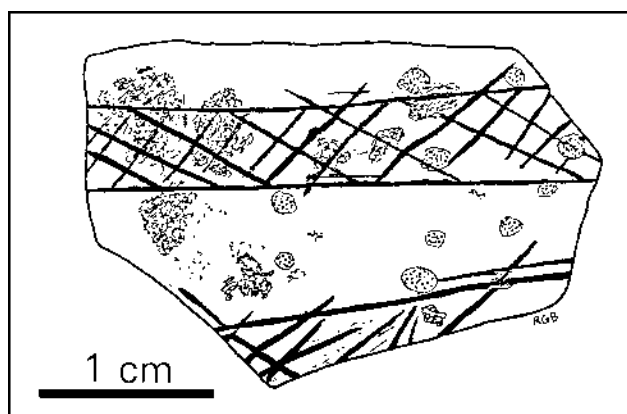


Figure 4. Engraved ostrich eggshell fragment from the Upper Palaeolithic, Patne, India.

Marked ostrich eggshells have been reported from four central Indian sites (Kumar et al. 1988), which are among over forty known sites of ostrich eggshell in India. Radiocarbon dating of the shells places them roughly between 25 000 and 40 000 years BP. The markings on 45 of the 46 known specimens are, however, attributable to mycorrhizal micro-organisms rather than human workmanship (Bednarik 1992a). Similar markings occur on Siberian ivory and Chinese and European bone finds. The remaining specimen of Indian ostrich eggshell is from Patne (Figure 4) and bears a non-figurative pattern that was clearly engraved with a stone tool (Bednarik 1992a). It is thought to be 25 000 years old. The carved and polished bone object found in the Belan valley, Uttar Pradesh, has been described as a 'mother goddess' (e.g. Misra 1977: 49). It is, however, not a female figurine, but a well-shaped bone harpoon.

Turning next to the claims for a Palaeolithic antiquity of rock art in India, we find that Wakankar's (1975, 1983) claim for the precedence of the green dynamic paintings, which he considered to be of the Upper Palaeolithic, has been negated by Tyagi (1988). Most contemporary researchers have great doubts that any Indian rock paintings are of Pleistocene age (e.g. Misra 1977; Neumayer 1983, 1993; Bednarik 1993b). Until 1990, petroglyphs were only known from the north and south of the country. The Raisen petroglyphs (Bednarik et al. 1991) are of unknown age, but are totally repatinated and coated with a silica skin, resembling the archaic petroglyphs of other continents. Some of the Bhimbetka petroglyphs were covered by undisturbed Lower Palaeolithic occupation strata (Bednarik 1992b, 1994b, 1994c) and they are of the Acheulian (Figure 5), being therefore among the oldest known rock art in the world (Bednarik 1993b). Similar cupule-dominated assemblages of very early petroglyphs have recently been reported from three further central Indian sites, and they too have been suggested to be either Lower or Middle Palaeolithic, particularly at Daraki-Chattan (Kumar 1996). This claim is currently being subjected to scientific testing by the EIP Project, and international commission. Striations on a wear facet of a haematite pebble from the Acheulian of Hunsgi, Karnataka, were apparently the result of use of the pebble as a crayon, to mark a hard rock surface (Bednarik 1990), providing further palaeoart evidence of the Lower Palaeolithic.

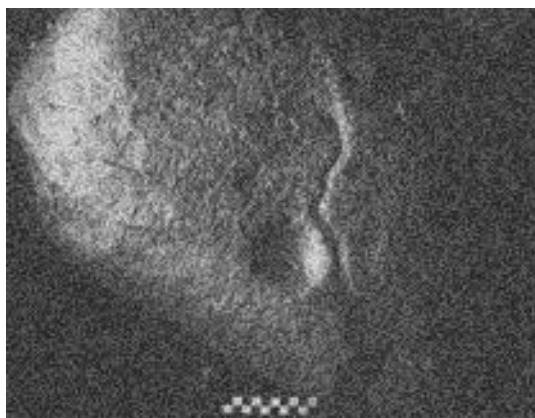


Figure 5. Cupule and meandering groove in Acheulian occupation layer of Auditorium Cave Bhimbetka, India. The evidence that this is among the oldest currently known rock art in the world is strongly supported by recent evidence from Daraki-Chattan, another Indian quartzite cave.

An engraved limestone cobble from the late Palaeolithic site of Urkan e-Rub, Israel, is between 14 500 and 19 000 years old (Hovers 1990). A somewhat older, small limestone slab from Hayonim Cave also bears engravings on both faces, and it is of the Aurignacian (Belfer-Cohen and Bar-Yosef 1981). Non-figurative rock engravings in caves at Mount Carmel have been suggested to include Palaeolithic marks (Ronen and Barton 1981). Engraved stone artefacts of the Middle Palaeolithic have been found at Quneitra (Goren-Inbar 1990) and Qafzeh Cave (Hovers et al. 1997). Incised bones of the Mousterian have been found in Kebara Cave, also in Israel (Davis 1974). Even older is a scoria pebble of 35 mm, excavated in an Acheulian occupation layer at Berekhat Ram, Golan Heights (Goren-Inbar 1986), and dated to between 233 000 BP and 800 000 BP (probably under 300 000 years old, however). The pebble has the natural shape of a female human torso, head and arms, and it bears artificial markings emphasising neck and arms.

Europe

Despite the qualifications that apply to nearly all claimed datings of the Upper Palaeolithic rock art of Europe (Bednarik 1996), it is clear that this magnificent art corpus is between roughly 32 000 and 10 500 years old. This parietal art, together with the portable art of the same time span, is the most thoroughly studied palaeoart. The parietal Palaeolithic art of Europe has been claimed to occur at about 300 sites across Europe (Bouvier 1993 lists 291, plus two sites in Germany; Hahn 1991; and several reputed Palaeolithic open air sites on the Iberian Peninsula; Bahn 1995; but see Bednarik 1995c, in press). The oldest safely dated evidence of this tradition is at Chauvet Cave, France (Clottes et al. 1995), being about 32 000 years BP.

The earliest known rock art of Europe, however, is not of the Upper Palaeolithic, it consists of a set of eighteen cupules found on the underside of a limestone slab placed over the burial of a Neanderthal child (Peyrony 1934). Mousterian and immediately post-Mousterian cupules occur also elsewhere (Leonardi 1988; Beaune 1993). Further apparently non-utilitarian evidence occurs in the form of portable objects, even from the Lower Palaeolithic period. Mousterian examples are engravings and apparently artificial notches on bone remains from such Mousterian sites as La Quina (Martin 1907-10), Petit-Puymoyen, Montgaudier (Crémades 1996), abri Lartet, abri Suard (eight specimens; Débenath and Duport 1971) and La Ferrassie in France (Capitan and Peyrony 1921); Cueva Morín (Freeman and González Echegaray 1983) in Spain; Bacho Kiro, Bulgaria (Marshack 1976); Tagliente rockshelter, Italy (Leonardi

1988); as well as from French Charentian sites (Bouvier 1987). A serrated bone fragment has been reported from the Mousterian of Schulen, Belgium (Huyge 1990), and the Crimean cave Prolom II yielded several marked Micoquian specimens (Stepanchuk 1993), as has Oldisleben 1 (Günther 1994) (Figure 6). Non-figurative Mousterian engravings have also been found on stone, at several sites in Italy (Leonardi 1988) and Hungary (Vértes 1964, 1965).

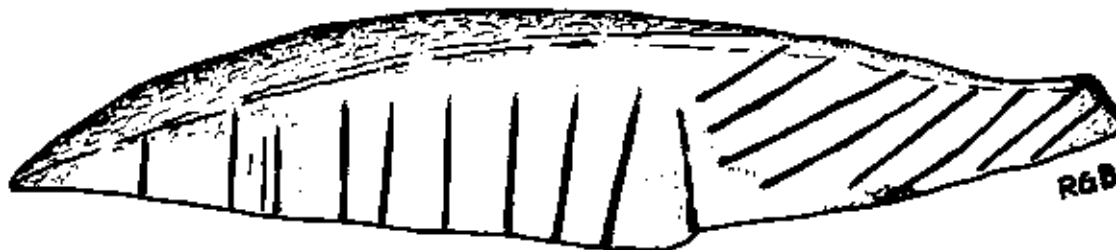


Figure 6. Engraved scapula fragment from the Micoquian site Oldisleben 1, Germany.

A few of these Middle Palaeolithic objects have been questioned and it has been suggested that they might be taphonomic products. But this is certainly not the case in many specimens, such as the bone artefacts with series of cuts from Taubach near Weimar, (Kuckenburger 1997), the mammoth ivory fragment with a series of well over 20 short, obliquely cut notches from Wyhlen near Lörrach (Kuckenburger 1996: 141) (both sites in Germany), the bovid mandible with nine regularly spaced engraved lines, crossed by another six lines of different length, from the Mousterian layers in Peyrere 1 Cave near Arreau, Aure valley, Hautes-Pyrénées, France (d'Errico and Allard 1997), or the engraved schist plaque with about 43 incised sub-parallel lines from Temnata Cave near Karlukovo, Bulgaria (Crémades et al. 1995).



Figure 7. Engraved fragment of a forest elephant bone from a Lower Palaeolithic industry at Bilzingsleben, Germany, one of seven palaeoart finds from this site.

Much older than these Middle Palaeolithic engravings are those from Bilzingsleben, Germany (Figure 7), which occur on fragments of bone, ivory and stone and are roughly 300 000 years old (Behm-Blancke 1983; Mania and Mania 1988; Bednarik 1993e). A similarly engraved elephant bone is from Stránska skála, Czech Republic (Valoch 1987) but is doubtful. However, the engraved bone fragment from the Upper Acheulian of Sainte Anne I, at Polignac, Haute-Loire, France bears ten certainly anthropic cuts along its edge (Raynal and Séguy 1986; cf. Crémades 1996.). There are also a striated haematite pebble of the Acheulian from Bečov, Czech Republic (Marshack 1981); several faceted pieces of limonite among the seventy-five found at Terra Amata, France (de Lumley 1966); and an apparently shaped slab of ochre was reported from Ambrona, Spain (Howell 1966).

Africa

From the African Pleistocene, figurative portable art has been reported only from the Middle Stone Age (MSA) of Apollo 11 Cave, Namibia (Wendt 1974), thought to be 26-28 000 years old (Figure 8). Older bone objects with serrations are known from the MSA of several sites: Klasies River Mouth, South Africa (Singer and Wymer 1982), Border Cave, Swaziland (Beaumont et al. 1978) and again Apollo 11 Cave (Wendt 1974). A wooden fragment with engraved lines comes from the MSA of Florisbad, Orange Free State (Volman 1984). Engraved ostrich eggshell fragments from the Howieson's Poort phase of Apollo 11 Cave are perhaps 80 000 to 70 000 years old. Recently, engraved ostrich eggshell fragments have been obtained from the MSA of Diepkloof Cave in the south-western Cape (Beaumont 1992; Bednarik 1994b).

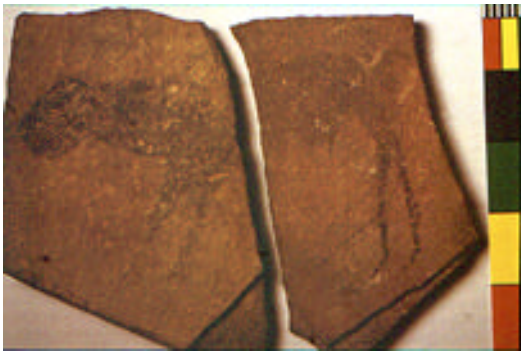


Figure 8. Painted zoomorph from the Middle Stone Age of Apollo 11 Cave, Namibia.

Evidence of ochre use in Bambata and Pomongwe Caves in Zimbabwe (Klein 1978) is thought to be over 125 000 years old, and the extensive mining evidence in Lion Cavern, South Africa (Beaumont and Boshier 1972) includes a radiocarbon date of about 43 200 BP. Two lumps of red volcanic tuff (Oakley 1981: 207) were recovered in the Developed Oldowan levels of Olduvai BK II, Tanzania (Leakey 1958). Apparent use of iron pigments has been widely recorded in the MSA (Klein 1978; Beaumont et al. 1978; Singer and Wymer 1982; Inskeep 1962; Clark 1988; Walker 1987). Some of the most extensive early evidence of haematite use comes from Wonderwork Cave, in the northern Cape region of South Africa. Every level of the excavation has produced an abundance of ochre fragments, occurring together with Acheulian bifaces and exotic quartz crystals (Bednarik 1994b). More than seventy red ochre pieces were excavated at the site GnJh-15 in the Kapthurin Formation, Kenya, >285 000 years old (McBrearty 2001: 92). At least 306 pigment pieces of specularite, haematite, limonite, ochrous sandstone and manganese dioxide at Twin Rivers, Zambia, are also of the Middle Pleistocene (Barham 2002). Two engraved fragments of ochre bearing geometric markings (Figure 9) have been excavated from the MSA of Blombos Cave, South Africa (d'Errico et al. 2001).

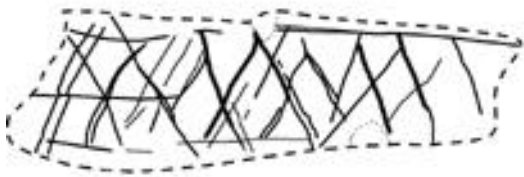


Figure 9. The engravings on one of the decorated ochre pieces from Blombos Cave, South Africa.

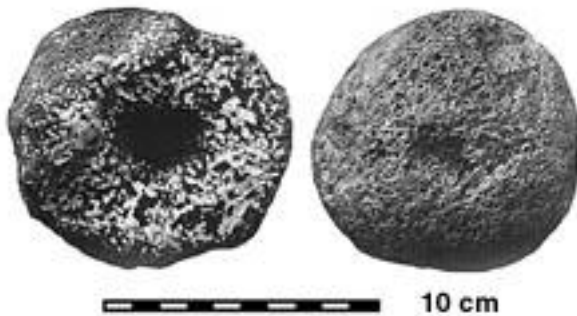


Figure 10. Two sides of a cobble with apparent cupules, Olduvai Gorge, Tanzania.

Peter Beaumont has very recently reported finding extremely early cupule sites in the Korannaberg region of the southern Kalahari. Like those in India they occur on heavily metamorphosed and thus particularly weathering-resistant quartzite. They bring to mind two other finds, the grid pattern on a Fauresmith grindstone Laidler (1933) excavated in at the Blind River mouth in East London, South Africa; and the grooved and pecked phonolite cobble from Olduvai FLK North 1 in Bed 1, Tanzania (Leakey 1971: 269), which bears what appears to be a cupule on each side (Figure 10).

Morocco has recently yielded two important finds from the Acheulian, the anthropomorphous Tan-Tan quartzite figurine (Bednarik 2001) and the Erfoud manuport (Bednarik 2002a) (Figure 11). Finally, the water-worn jasperite cobble found in the level 3 bone breccia at Makapansgat (Transvaal, South Africa) in 1925 was brought into the cave, either by australopithecines or very early hominids (Dart 1974; Bednarik 1998a). It bears several natural markings that give it the appearance of a creature's head, depending on the way it is viewed.



Figure 11. The Acheulian Erfoud manuport, Morocco.



Figure 12. The Makapansgat cobble, South Africa. This manuport was deposited in the cave almost 3 million years ago, and is therefore the earliest palaeoart object known. Scale in cm.

As we lack any other suggestions that *Australopithecus* recognised the iconic qualities of such objects, the significance of this find remains tentative, but that does not warrant its consistent exclusion from nearly all discussions of possible traces of early symbolism (Figure 12). After all, we know that *Homo erectus* had the capability of crossing the sea well before 700 000 years ago (Bednarik 1997a, 1999; Bednarik and Kuckenbunrg 1999). This level of sophistication is difficult to explain, unless early hominids were in general cognitively much more developed than is generally assumed.

Australia

The persistent claims of the precedence of western European art are particularly hard to understand when one considers the long-standing expectation that Australian rock art would be shown to be extremely old (e.g. Basedow 1914). Researchers such as Noble and Davidson (1993) and Bednarik and You (1991) emphasise that the first colonists of the island continent already possessed symbolic capacities in all probability, and art-like markings were produced elsewhere long before Ice Age Australia was settled by Middle Palaeolithic seafarers, prior to 60 000 BP (Roberts et al. 1993). As in most other continents, cupules are regarded as being extremely old in Australia (Bednarik 1993f; Taçon et al. 1997). This is the case despite the misinterpretation of the thermoluminescence data from the Jinnium site in Northern Territory (Fullagar et al. 1996).



Figure 13. Arrangement of circle petroglyphs on granite dated about 27 000 years BP, Pilbara, Australia, with traditional custodian who knows their meaning.

The earliest reasonably sound age information from Australian petroglyphs comes from a limestone cave on the continent's southern coast, where petroglyphs were concealed under a layer of travertine that yielded a uranium-thorium date of about 28 000 years (Bednarik 1997b). This has recently been matched by microerosion analysis from similar petroglyphs in the arid Pilbara region (Bednarik 2002b) (Figure 13).

Despite the wealth of portable art in Australia, none has so far been dated to the Pleistocene. The six so-called limestone plaques from Devils Lair in southwestern Australia (Dortch 1976) were found to be natural products bearing animal scratches and taphonomic marks (Bednarik 1998b). Striated haematite occurs in abundance from the continent's earliest known occupation levels onwards (Jones 1985; Roberts et al. 1990).

Discussion

This brief list of Pleistocene palaeoart should suffice to demonstrate several key points about the beginnings of 'art'. It also shows that the dominant model of how, where and when palaeoart began is fundamentally flawed, and is essentially a mythology of Eurocentric researchers. Any such model that cannot accommodate the following basic premises is unworthy of further consideration:

1. There is hundreds of times as much Pleistocene rock art in Australia as there is in Europe; it comprises hundreds of thousands of petroglyphs.
2. All of the Australian Pleistocene rock art is assumed to be attributable to people with a Middle Palaeolithic rather than an Upper Palaeolithic technology, hence there is more 'Middle Palaeolithic art' surviving in the world than Upper Palaeolithic.
3. Palaeoart commences several hundred millennia ago in Asia, and even in Europe there is ample evidence of it beginning around late Lower Palaeolithic times.
4. Graphic figurative production of the Pleistocene is almost entirely limited to Europe, there is only one apparent exception known in Africa and two or three in Asia. In a global perspective, the iconic two-dimensional palaeoart of Europe almost appears like an 'aberration'.

Similarly, the until now dominant model, which has palaeoart first appear in south-western Europe and in the form of figurative or iconic depictions is to be regarded as an aberration of a Eurocentric mode of thinking. The main theatres in the cognitive evolution of hominids were the major population centres of southern Asia and Africa, whereas Europe was always of marginal importance in the major cultural developments.

Similarly, the stylistic constructs and chronological sequences archaeologists have invented for the Upper Palaeolithic rock art of Europe was largely a figment of their fertile imagination, and has now collapsed under the weight of the contrary evidence (Bednarik 1995d). Considering that all of the traditional main pillars of conventional wisdom on which Pleistocene art studies were based have now fallen, it is incredible that this research tradition seems to carry on as if the discipline could be continued in the same way it has floundered and stumbled through the entire twentieth century. This discipline is heading for a paradigmatic shift such as it has never experienced before, and scholars who oppose such a reform are requested to inform themselves properly about these current developments.

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