

# LOWER PALAEOOLITHIC ROCK ART OF INDIA AND ITS GLOBAL CONTEXT

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## Introduction

Palaeoart of the Lower Palaeolithic period seems to have been found for well over 150 years but it has remained largely ignored, misinterpreted or at least controversial. This paper summarizes the currently available credible evidence of symbolic or non-utilitarian behaviour from the Lower Palaeolithic. Material evidence of this kind is defined as 'palaeoart'; 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 hominins. The relevant evidence can readily be divided into a few groups: small perforated objects that may have been 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 property (manuports).

Palaeoart finds of this earliest time of symbol use are still exceedingly rare globally, and among those 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. In the first part of this paper I will review the current relevant evidence on a global basis, in the second part the state of knowledge concerning the palaeoart beginnings in India will be considered, where the earliest currently known rock art of the world occurs.

## PALAEOART OF THE WORLD'S LOWER PALAEOOLITHIC

### Beads and pendants

It is well known that the existence of Palaeolithic 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 excavated at St Acheul in France, he also found a large number of fossilized sponge fragments with central perforations (supposedly *Coscinopora globularis*), which may or may not be manuports. 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: 272–76) 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. In 2004 I examined 325 specimens collected at French and English Acheulian sites before the early 20th century, finding that they had all been incorrectly identified, being actually *Porosphaera globularis* fossils. Among them were numerous examples with enlarged or completed tunnels and with extensive wear from having been used as beads on a string (Bednarik 2005). 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.

What renders the possibility that these finds were used as beads particularly plausible is the discovery of clearly made disc beads from a Late Acheulian site in Libya, El Greifa (Ziegert 1995; Bednarik 1997a). According to Th/U dating and other evidence, these ostrich eggshell beads are about 200 ka (thousand years) old, and replication experiments have shown that their manufacture involved a complex procedure. Originally, only three damaged specimens were found, but more have become available since.

There can be no doubt about the authenticity of two pendants from the Repolust Cave in Styria, Austria (Bednarik 1992, 1997a). Their perforations are clearly anthropic, but since their discovery (Mottl 1951) they have attracted almost no attention. A drilled wolf incisor (Figure 1) and flaked bone point were recovered together with a large lithic assemblage variously describes as Levalloisian, Tayacian and Clactonian, probably a late Lower Palaeolithic 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 palaeontology, especially the phylogeny of the bears, the occupation seems to be in the order of 300 ka old.



**Figure 1.** Wolf incisor from Repolust Cave, Austria, perforated at its root, Lower Palaeolithic.

### Petroglyphs

Whereas many (though 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. Petro-

glyphs relating to Middle Palaeolithic traditions are very common, in fact they are more common than Upper Palaeolithic rock art (Bednarik 1995: 628). The number of petroglyphs credibly attributed to the Lower Palaeolithic 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, 1994a). 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. Another Indian quartzite cave, Daraki-Chattan, contains two vertical panels densely covered by 498 cupules (Kumar 1996) and has recently been safely dated to a Lower Palaeolithic chopping tool horizon (Bednarik et al. 2005). Both sites will be considered in the second part of this paper.

While some Indian sites thus present the currently oldest known rock art in the world, there are also four African finds that need to be considered here. First, there is the phonolite cobble 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 palaeoart object, perhaps it was utilitarian. Nevertheless, the possibility that these pecked depressions are particularly early cupules should not be discounted a priori.

A second find in that general region 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 (pers. comm.) 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 artefacts belong generally to the MSA (c. 120 ka old), the Fauresmith (c. 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.

Finally, a Nubian sandstone slab, c. 60 cm long, bears a distinct grinding hollow of about 10 cm, around which seven very small cupules (c. 1 cm diameter) are arranged. Found with red and yellow ochre lumps, this object was excavated on Sai Island, Sudan, and is of the Lower Sangoan, c. 200,000 years old (Van Peer et al. 2003).

### Pigment use

Petroglyphs of the Lower Palaeolithic may still be comparatively rare phenomena, but evidence of the use of iron oxides and hydroxides, presumably as colouring 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, 1994b).

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 and Beaumont 1992; Bednarik 1994b). Much older still are the two lumps of 'ochre' 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 and 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, 2003).

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 and Hewitt 1928; Beaumont and Boshier 1972; Beaumont 1973; Miller et al. 1999; Grün and 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 Palaeolithic 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 Beçov, Czech Republic, striated on two faces. The floor near this find was covered by pigment powder, suggesting an activity of manufacturing colouring 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 colour a rock surface (Bednarik 1990). We cannot know what these colour 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 faceted fragments were noticed among 75 pieces of red, brown and yellow, fire-treated limonite deposited about 380 ka ago (de 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 Palaeolithic has only recently been seriously considered and we currently have only two specimens that appear to deserve the designation 'proto-figurine'. This requires evidence that the specimens are not just iconic, in the sense that they resemble another object which 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 and Peltz 1995). Most commenting authors rejected the find in the subsequent years without examining it (e.g. Chase and Dibble 1987; Davidson 1990; Pelcin 1994; Nowell 1995; Noble and Davidson 1996: 75; Davidson and Noble 1998). Marshack (1996, 1997) conducted a microscopic study of the object and its various markings, concluding that the grooves and abrasive markings were made with stone tools, and his main findings were corroborated by d'Errico and Nowell (2000). The latter authors accepted the object's artefact 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 gen-

eral 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, 2003). Its anthropomorphous form is much more pronounced than that of the Israeli specimen and is emphasized by eight symmetrically arranged grooves (Figure 2). Five of these lines were found to have been modified and microscopic traces of a red pigment seem to indicate that the figurine had once been coated by red paint.



*Figure 2. Middle Acheulian quartzite proto-figurine with modified grooves, Tan-Tan, Morocco.*

### Engravings

The archaeological community remains divided over the status of the several engraved objects reported from the Lower Palaeolithic. The largest site assemblage is the one from Bilzingsleben, a major occupation site (more than 1000 m<sup>2</sup> excavated) of the Holstein Interglacial in Germany (Mania 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 five apparently engraved bone fragments, mostly of the forest elephant (Figure 3), one presumed engraving on the fragment of a large ivory point, and one on a quartzite slab (Mania and Mania 1988; Bednarik 1988, 1993b, 1995). It is generally accepted that the



**Figure 3.** Engraved lines on one of the bone fragments from the Lower Palaeolithic of Bilzingsleben, Germany.

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 laser-microscopic 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 Palaeolithic finds. These and other factors negate the attribution of the marks to utilitarian activities. Finally, one of the several engraved bone fragments from gravel pit Oldisleben 1, Thuringia (Germany), found with an apparent Micoquian industry and Middle Pleistocene fauna (Bednarik 2006), displays markings almost identical to those on the No. 1 object from Bilzingsleben. This scapula fragment bears two distinctly intentional sets totalling almost twenty engraved parallel lines, arranged in the same manner as those on the Bilzingsleben specimen. These and other consistent features in the earliest known palaeoart suggest that even in these remote times, long-lived conventions that are definable as 'traditions' already existed (Bednarik 1995; Hodgson 2000).

The status of a similarly marked elephant bone from another central European hominin 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 of an engraved bone fragment from the Acheulian of Sainte Anne I, France, which bears ten short cuts along an edge, seems assured (Raynal and Séguy 1986; 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 Palaeolithic. 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 ka and 260 ka (Imbrie et al. 1984), and are thus of an antiquity matching that of the Bilzingsleben finds in order of magnitude.

### Manuports

Unmodified objects collected, transported and deposited by hominins 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 hominins, it can for example be observed in various bird species.

The earliest reported manuport dates from the very beginnings of hominin phylogeny, being almost 3 Ma (million years) old. Until recently it was attributed to *Australopithecus* but the discovery of *Kenyanthropus platyops* (3.5 Ma) offers another possibility. The Makapansgat jasperite cobble was ex-

cavated 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 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 kilometres from the site, either by australopithecines or by some of the earliest hominins (Figure 4).



**Figure 4.** *Jasperite cobble manuport excavated in Makapansgat, South Africa, Pliocene, scale in cm.*

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 Wonderwerk Cave, the lowest of which have been suggested to be about 900 or 800 ka old (P. Beaumont, pers. comm.). The Lower Acheulian site Singi Talav in India has yielded six complete and unmodified quartz prisms ranging from only 7–25 mm. They differ mineralogically, which suggests that they originate from different crystal geodes 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 Palaeolithic 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 artefact, 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 hominins 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 2002). This fossil cast of *Orthoceras* sp. is distinctively reminiscent of a human penis in every aspect of form, size and surface texture (Figure 5). Cuttlefish fossils are very common in other



**Figure 5.** *Unmodified manuport of a cuttlefish fossil from the Late Acheulian of Erfoud, Morocco, resembling a human penis.*

parts of Morocco, but they do not occur naturally in the region of the find site, so this is also a Lower Palaeolithic manuport.

Two more finds would need to be included in a comprehensive review, and they are among the earliest recorded. One is the haunting countenance of a face seen on a hollow chert nodule found by none less than Boucher de Perthes (1846). The other, also a flint piece of the French Acheulian, resembles a therianthrope's head and was found by Dharwent (1913) in or before 1902. I have not examined these. However, another specimen mentioned, the Middle Acheulian handaxe from l'Observatoire, Monaco, which seems to bear a set of deeply cut linear markings on its cortex (Lumley 1976: 834–5, Fig. 12.5) is clearly a natural product.

### Discussion

Not only has it become clear that recognition of three-dimensional iconic resemblance was available in the Lower Palaeolithic, 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 Lower Palaeolithic, and later of the Middle Palaeolithic from France (La Ferrassie) to Australia, also survived to historic times (in Tasmania). In the face of this evidence it is no longer reasonable to continue denying that palaeoart traditions already existed in the Lower Palaeolithic. 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 been used.

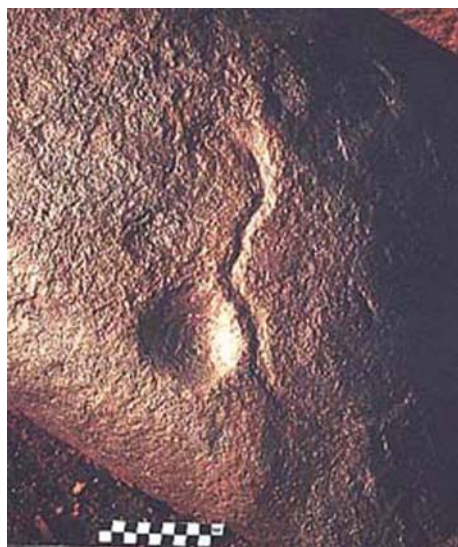
These observations indicate that we have severely misjudged the cognitive and cultural competence of early humans. We now accept that hominins such as *Sahelanthropus tchadensis* may have begun their reign 7 Ma ago, and that almost 3 Ma ago a hominin found the Makapansgat cobble sufficiently interesting to carry it around (Bednarik 1998). Not only is it entirely reasonable to expect

the hominins 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 hominins for seven million years. The view that this was followed by an immense 'explosion' in their cognitive faculties during the last third of the Late Pleistocene (the 'African Eve model'), i.e. the last 0.5% of the duration of hominin evolution, is similarly absurd. Yet this is what palaeoanthropology and archaeology have favoured over the last two decades, especially in the Anglo-American school of archaeology. The record indicates otherwise, and it tells us also that hominins have been seafarers since the late Early Pleistocene, i.e. for about one million years (Bednarik 1999, 2001c; Bednarik and Kuckenburg 1999). Consequently, the 'discontinuist' or 'short-range' model of human evolution 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 of hominins 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 today regard themselves as the pinnacle of evolution, *Homo sapiens sapiens*.

The traditional view in archaeology that Lower Palaeolithic hominins lacked human cognitive capacities is refuted here by the presentation of a series of finds from that period, indicating that it gave rise to discernible traditions of palaeoart production. While the number of such specimens remains small, distinctive patterning in their mode of occurrence and in the forms of this evidence facilitates the formulation of a hypothesis of 'art' origins. Accordingly, the earliest surviving palaeoart consists principally of linear engravings organized by specific conventions, unstructured groups of cupules and minimally modified iconic figurines.

## INDIAN ROCK ART OF THE LOWER PALAEOLITHIC

Having thus clarified the current status of the global search for the beginnings of art-like production and, presumably, of 'modern' human cognition, we now turn to the Indian theatre of these developments. We have already noted above that India has contributed some of the key evidence in this quest. Among it are the indications of Acheulian quartz crystal collection from Singi Talav, the Acheulian haematite crayon from Hunsgi, and the Lower Palaeolithic petroglyphs from both Auditorium Cave and Daraki-Chattan. There is little more to be said about the first two examples, and sceptics may question their significance. However, when we consider the evidence of rock art production from at least two sites (others have also been named as contenders for Lower Palaeolithic age; Bednarik et al. 2005), no amount of scepticism can explain away the empirical evidence.



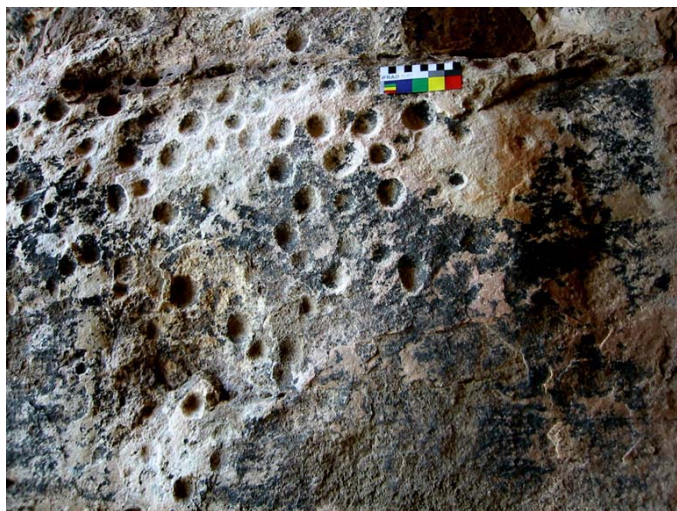
*Figure 6. Cupule and meandering groove on a boulder from the Acheulian deposit of Auditorium Cave, Bhimbetka, India.*

The first rock art ascribed to the Lower Palaeolithic were the eleven petroglyphs in Auditorium Cave, Bhimbetka complex, Madhya Pradesh, India (Bednarik 1993a, 1994a). 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 sub-

stantial Late Acheulian occupation deposits (Figure 6). The latter were overlain by a horizon of heavily calcite-cemented Middle Palaeolithic sediment that virtually excluded the possibility of post-depositional disturbance. Below two substantial Acheulian strata, an occupation layer of a Lower Palaeolithic chopping tool industry was also excavated (Wakankar 1975; Bednarik 1993a, 1996; Bednarik et al. 2005) and it is now thought that the two stratified petroglyphs relate to this rather than the Acheulian deposits. The co-occurrence of the two buried petroglyphs and the nine cupules above ground at the site suggests that the latter were created at the same time, and this was confirmed by microerosion analysis (Bednarik 1996). The cave is formed in heavily-metamorphosed quartzite, a rock of such hardness that it was extensively quarried by Acheulian hominins at several Bhimbetka sites. This, together with their sheltered location inside a cave, is thought to have facilitated the survival of the Auditorium Cave petroglyphs since the Lower Palaeolithic.

At the time of the proposal of the Lower Palaeolithic antiquity of the Bhimbetka petroglyphs, this revolutionary claim was controversial, but within a few years it found unexpected validation in a newly discovered site. In 1996, another Indian occurrence of very early petroglyphs was reported, the quartzite cave Daraki-Chattan (Kumar 1996). Because apparently Middle Palaeolithic and Acheulian lithics occur on the surface of the cave's floor deposit, it was suggested that the cupules on its walls might also be of great age (Figure 7). Similarly, two further cupule sites in Rajasthan, of exposed granite boulders as well as in a further quartzite shelter, were also considered to be of great antiquity, although here the evidence remains circumstantial (Kumar and Sharma 1995). In response to these discoveries, I established the Early Indian Petroglyphs (EIP) Project with G. Kumar, with the intention of testing these claims by an international panel of specialists (Bednarik 2000, 2001a). 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 Lower Palaeolithic occupation deposit. These rock slabs bear a total of 28 cupules, identical to those on the walls above, and more





**Figure 7.** Cupules on vertical quartzite wall in Daraki-Chattan Cave, India, safely attributed to the Lower Palaeolithic.

such finds are expected from the still incomplete excavation. Also, two engraved grooves were found on a boulder excavated in the Lower Palaeolithic deposit, and one cupule was encountered in situ in the excavation. Stone tools exhibiting Lower Palaeolithic characteristics occurred both above and together with these slabs, in deposits that are considered undisturbed. Most importantly, numerous hammerstones used in the production of the cupules were recovered from the excavation, mostly from the layer below the exfoliated wall fragments, which contained only chopping tools and was free of bifaces (Figure 8). OSL dating of the deposit at Daraki-Chattan and at two Bhimbetka sites is in progress (Bednarik et al. 2005). There can be no reasonable doubts that the cupules, or at least some of them, were made by people of a Lower Palaeolithic tool typology dominated by choppers resembling those of the African Oldowan, and predating the Acheulian. This is the earliest stone tool tradition occurring in India. Unfortunately, the chronology and typology of the early human occupation of India remain largely unexplored. Therefore it would be premature to speculate about the actual age of the Indian petroglyphs of the Lower Palaeolithic.

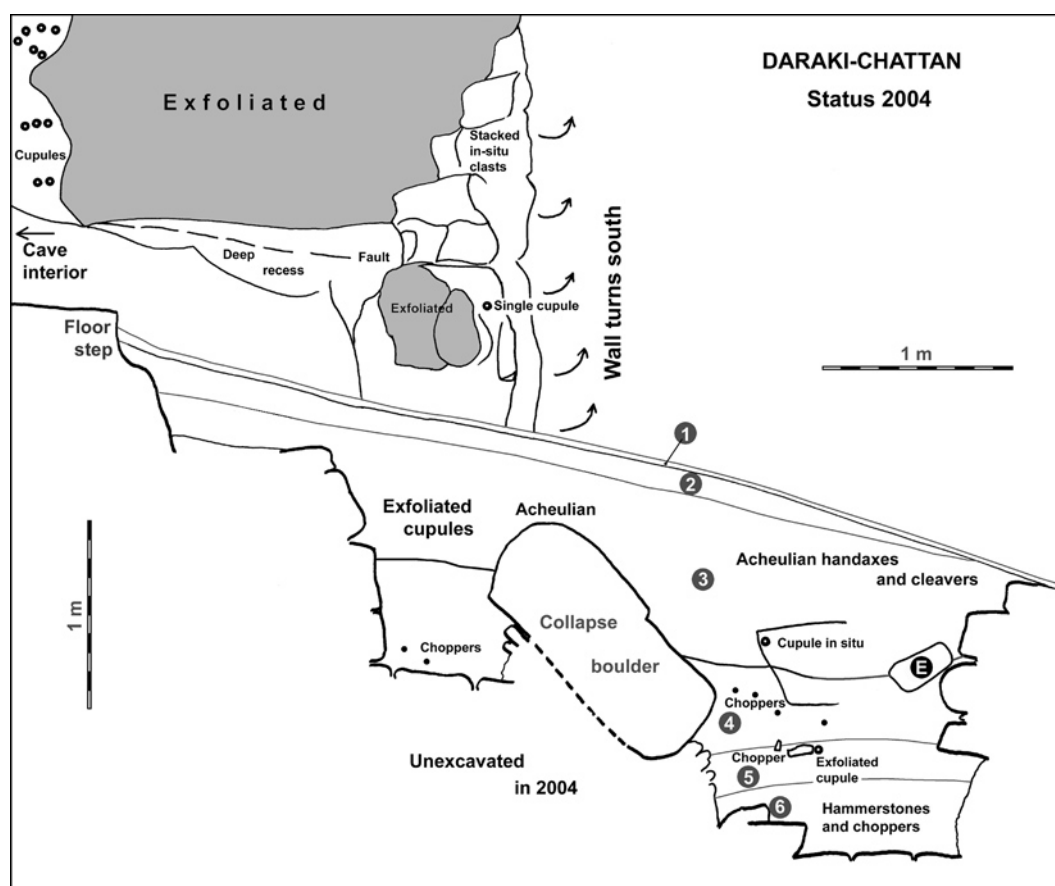
### The Lower Palaeolithic in India

Although Lower and Middle Palaeolithic stone tool traditions are widespread in India (Petraglia

1998), represented in massive quantities and typologically accounted for (Korisettar 2002), their absolute chronology has remained largely unresolved so far. This is due both to a paucity of excavated sites (most known sites are surface scatters) and a pronounced lack of well-dated sites. Prior to the excavation of three Bhimbetka sites in the 1970s, only one primary Acheulian site had been excavated in India (Bose 1940; Bose and Sen 1948). There are some preliminary indications that the Middle Palaeolithic commenced prior to 160 ka ago. At Didwana (V. N. Misra et al. 1982; V. N. Misra et al. 1988; Gaillard et al. 1986; Gaillard et al. 1990), thorium-uranium dates for calcrete associated with Middle Palaeolithic industries (V. N. Misra 1989) range from 144,000 years upwards. Their validity is reinforced by a thermoluminescence date of  $163,000 \pm 21,000$  years BP from just below the level dated by  $^{230}\text{Th}/^{234}\text{U}$  to  $144,000 \pm 12,000$  years BP. A single thermoluminescence date for a Middle Palaeolithic deposit in a sand dune in Rajasthan has been reported to be  $>100,000$  years BP (Korisettar 2002).

Another indicator of age comes from the Jhalon and Baghor formations in the central Narmada and Son valleys, rich in mammalian faunal remains and stone tools. They contain a layer of Youngest Toba Ash, up to 3 m thick (Acharyya and Basu 1993), which has been dated at  $74,000 \pm 2000$  years BP in Indonesia, based on argon and potassium-argon determinations (Chesner et al. 1991). At the upper end of the time scale, carbon isotope dates as young as  $31,980 + 5715/ - 3340$  (Mula Dam, Maharashtra) and  $33,700 + 1820/ - 1625$  years BP (Ratikarar, Madhya Pradesh) have been reported for Middle Palaeolithic horizons (V. D. Misra 1977: 62).

Prospects for a comprehensive temporal framework are at least as bleak for the Lower Palaeolithic period, which is represented primarily by Acheulian industries. However, this dominance of Acheulian forms may well be an artefact of collecting activities that may have favoured the easily recognizable Acheulian types, notably well-made handaxes. Several attempts to use the thorium-uranium method, at Didwana, Yedurwadi and Nevasa (Raghvan et al. 1989; Mishra 1992), placed the Acheulian beyond the method's practical range (which ends at about 350 ka BP). But one of the molars from Teggihalli did yield such a date (of *Bos*,



**Figure 8.** Generalized section view of the entrance of Daraki-Chattan, looking south, showing the spatial relationships of the exfoliated areas on the southern wall, the outermost wall cupules, the sediment layers, and the principal features contained in them, such as exfoliated slabs bearing cupules. The engraved boulder E and the excavated in-situ cupule are also shown. Status November 2004.

287,731 ± 27,169 / - 18,180  $^{230}\text{Th}/^{234}\text{U}$  years BP), as did a molar from Sadab (of *Elaphus*, 290,405 ± 20,999 / - 18,186 years BP) (Szabo et al. 1990). However, an *Elaphus* molar from the Acheulian of Tegihalli is over 350 ka old. An attempt to estimate the age of a presumed Lower Palaeolithic cupule in Auditorium Cave, Bhimbetka, by microerosion analysis remained inconclusive because the age was also beyond that method's limit, which is thought to be in the order of 100 ka in this particular context (Bednarik 1996).

While the Lower Acheulian remains essentially undated, preliminary indications suggest a late Middle Pleistocene antiquity for the Final Acheulian. Thorium-uranium dates from three calcareous conglomerates containing Acheulian artefacts suggest ages in the order of 200 ka (Korisettar 2002). These results are from the sites Nevasa (Pravara Basin), Yedurwadi (Krishna Basin) and Bori (Bhima Basin). The most recent date so far for

an Indian Acheulian deposit is perhaps the uranium-series result from a conglomerate travertine in the Hunsgi valley (Karnataka), which seems to overlie a Late Acheulian deposit (Paddayya 1991). The travertine's age of about 150 ka at Kaldevanahalli appears to confirm that the change from the Lower to the Middle Palaeolithic occurred between 200 and 150 ka ago.

In addition to these very sparse dates from the earliest periods of Indian history, there are several presumed 'relative datings', but these were always subject to a variety of qualifications. Early research emphasized the relation of artefacts to lateritic horizons (but cf. Guzder 1980) and biostratigraphic evidence (de Terra and Paterson 1939; Zeuner 1950; Badam 1973, 1979; Sankalia 1974), which often resulted in doubtful attributions. Sahasrabudhe and Rajaguru (1990), for instance, showed that there were at least two episodes of laterization evident in Maharashtra and that extensive fluvial reworking

occurred. Attempts to overcome these limitations included the use of fluorine/phosphate ratios (Kshirsagar 1993; Kshirsagar and Paddayya 1988–89; Kshirsagar and Gogte 1990), the utility of which was affected by issues of re-deposition of osteal materials (cf. Kshirsagar and Badam 1990; Badam 1995). Similarly, attempts to use weathering states of stone tools as a measure of the antiquity of lithics (e.g. Rajaguru 1985; Mishra 1982, 1994) are plagued by the significant taphonomic variables involved in weathering processes (cf. Bednarik 1979). The emergence of anomalous results and inconsistencies established in recent years illustrates a distinct need for a chronological framework based on a series of reliable numerical age estimations, especially from undisturbed Lower and Middle Palaeolithic occupation deposits.

There remains wide disagreement about the antiquity of the Early Acheulian. Based on the potassium-argon dating of volcanic ash in the Kukdi valley near Pune to 1.4 million years ago, some favour that magnitude of age for the earliest phase of that 'tradition' (S. Misra and Rajaguru 1994; Badam and Rajaguru 1994). An age of well over 400 ka seems also assured by thorium-uranium dating (S. Misra 1992; S. Misra and Rajaguru 1994). Others, especially Acharyya and Basu (1993), reject such a great antiquity for the Early Acheulian in the subcontinent.

By the time we arrive at the earliest phase of human presence in India, the available record fades into non-existence. It consists of a few tantalizing mentions of archaic cobble tools, similar to those of the Oldowan, well below Acheulian evidence and separated from it by sterile sediments at the first site it was described stratigraphically (Wakankar 1975). These quartzite tools from Auditorium Cave at Bhimbetka are partially decomposed and have not yet been studied in any systematic way. Since it is logical to expect human occupation evidence in India for at least two million years (because of the proven presence of hominins in China by that time), it is to be expected that cobble tools should precede the bifaces of the Acheulian, and one would have assumed that these have attracted some attention. In reality, they have remained practically ignored. While it may be justified to argue that much of India presents sedimentary facies that are less than perfect for the preservation of osteal

remains, which may explain the dearth of skeletal remains, this should not prevent the preservation of stone tools. Yet undeniably the first phase of human presence, perhaps the entire first half of human occupation of India, remains in effect archaeologically unexplored.

The only two hominin fossil specimens of Asia found between the Levant and Java/China, the Narmada calvaria and clavicle, were both recovered at Hathnora (H. de Lumley and Sonakia 1985; Sankhyan 1999), about forty kilometres south of Bhimbetka, where Acheulian petroglyphs were first identified. The partially preserved cranium was initially described as *Homo erectus narmadensis* (Sonakia 1984, 1997; M.-A. de Lumley and Sonakia 1985), but is now considered to be of an archaic *H. sapiens* with pronounced erectoid features (Kennedy et al. 1991; Bednarik 1997b). Its cranial capacity of 1200 to 1400 ml is conspicuously high, especially considering that this is thought to be a female specimen. The clavicle, however, is clearly from a 'pygmy' individual, being under two thirds of the size of most modern human groups. It is of an individual of a body size similar to *H. floresiensis*. Both specimens are among the most challenging hominin finds ever made, yet both remain widely ignored. There is, however, no evidence to show that the two finds are of the same individual, or even of the same sub-species. They simply co-occurred in the Unit I Boulder Conglomerate of the Hathnora site (H. de Lumley and Sonakia 1985). The rich accompanying fauna implies a middle or late Middle Pleistocene age for the hominin finds.

The hominin-bearing sediment at Hathnora has been suggested, without much tangible evidence, to be in the order of 200,000 years old. The only secure age information comes from a series of palaeomagnetic determinations, according to which the entire relevant sediment sequence at Hathnora is of the Brunhes Normal Chron, hence the human remains must be younger than 730 ka (Agrawal et al. 1988, 1989). On the other hand it is unlikely that they are under 150 ka old. Within this rather long interval, both tool typology and fauna point to the uppermost time zone. Having examined the Narmada calvaria, I consider that its most likely age is in the order of 200 ka, because its essentially modern cranial volume renders a much greater age unlikely.

## Conclusion

The coincidence of the geographically very isolated Narmada hominins, distinguished respectively by exceptional brain size and pygmy stature, with the earliest known petroglyphs, spatially and in the broadest sense possibly chronologically, is a tantalizing aspect of the evidence as it currently stands. Could there be merit in speculating why the earliest rock art known in the world happens to occur in the same area as these important and yet almost completely neglected human specimens? It may be more relevant to note that southern Asia (specifically in Indonesia) appears to be where seafaring first developed, in the order of one million years ago (Bednarik 1999, 2001c). While Africa may be the cradle of hominin evolution, southern Asia is more likely to be the main theatre of initial development of modern human cognition, self-awareness and technological competence. Perhaps we should see the very early appearance of petroglyphs in central India, together with the remains of a chopping tool tradition, in this light: as very early evidence of distinctively symbolic behaviour. The Lower Palaeolithic tradition of creating cupules and linear grooves demonstrated at two quartzite caves in Madhya Pradesh provides evidence of very specific cultural behaviour by hominins, almost certainly of the Middle Pleistocene period

A more accurate chronological placement of this earliest known rock art in the world is not possible at this stage. Reliable dating remains elusive, and the entire chronology of the Indian Lower Palaeolithic has been inadequately explored — most especially the earliest period is merely a nebulous construct at this stage. The audacious claims concerning the Bhimbetka petroglyphs have been soundly validated by the comprehensive archaeological evidence from Daraki-Chattan, demanding an age of the rock art of several hundred millennia. While this may seem incredible to conservative archaeologists, it must be remembered that the earliest known petroglyphs in every continent (except Antarctica) are completely dominated by cupules. Moreover, the earliest approximately dated cupules of Africa, the eight found on a sandstone slab excavated at Sai Island, Sudan, are thought to be in the order of 200,000 years old (Van Peer et al. 2003).

Therefore the evidence from India is quite consistent with what we know from other continents — except that it seems to be considerably older.

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