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## Emergence of Higher Thought 3.0-0.2 Ma B.P.

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## Emergence of higher thought 3.0–0.2 Ma B.P.

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The oldest known probable manuport is the dark reddish jasperite pebble from a layer with *Australopithecus* at Makapansgat, Transvaal (*ca.* 3 Ma).

There are indications at two earliest Acheulian sites in east Africa that *Homo erectus* of *ca.* 1.5 Ma B.P. was interested in red mineral pigment. At Terra Amata, near Nice, 75 shaped pieces of red ochre were found with the earliest European Acheulian industry (*ca.* 0.3 Ma B.P.). This occurrence indicates that to an Acheulian society red mineral pigment had great symbolic value.

Several flint and chert artefacts from Acheulian sites in Britain are described on account of embedded fossils, evidently regarded as symbolic, with a visual pattern stimulating to an aesthetic impulse in the minds of men who selected the material in preference to the more readily available plain flint. Most remarkable are two humanly struck flakes of coral-bearing chert found in the Swanscombe Gravels (0.2 Ma B.P.). This starry stone, it is inferred, was a manuport carried about 120 miles (*ca.* 193 km) from an outcrop of Jurassic (Portlandian) rock at Tisbury in Wiltshire.

Possibly the oldest known piece of evidence bearing on the predilections of the Late Pliocene hominids is the reddish cobble†, with presumably weathered-out features making it resemble a humanoid face, that was found in 1925 by W. I. Eitzman at the site that became known as the Limeworks Quarry, Makapansgat, in the Transvaal (Dart 1974). It was recovered from a pink stony breccia, later identified by T. C. Partridge (unpublished, 1980) as member 4 in his terminology, overlying the main level with *Australopithecus* remains (the grey breccia, member 3), and dated on the basis of palaeomagnetic readings (McFadden *et al.* 1979) at 3 Ma B.P. The cobble weighs *ca.* 260 g. It is jasperite, or banded ironstone of Precambrian age. The banded character reflects varying proportions of iron and silica in the make-up of the rock. The more deeply weathered layers are probably relatively rich in iron, while the more indurated ones are richer in silica (I. G. Stanistreet, unpublished, 1980). Banded ironstones outcropping about 3 miles (4.8 km) NNE of the limeworks were the probable source of the rock fragment (B. Maguire, unpublished, 1980) that was eroded to form this large pebble or cobble. It is obviously very water-worn, as though subjected to fluvial action, and may first have come to rest in the gravel of a river bed.

The means by which it was eventually transported from, say, a river bed to a cave breccia is a matter for speculation. On the principle of Occam's razor, it seems reasonable to accept Dart's hypothesis (see below), based on the remarkable fact that this reddish cobble was unique, quite foreign to the layer of pink stony breccia in which it was found. J. W. Kitching recalls that when he first saw the specimen it still had some of the pink breccia adhering to it

† It is preserved in the Bernard Price Institute for Palaeontology, University of the Witwatersrand, Johannesburg; catalogue number L1713.

(B. Maguire, unpublished, 1980). Dart suggests that one of the australopithecine hominids noticed this reddish head-like cobble (I say, perhaps at a river margin), picked it up and carried it as a treasured object to their temporary dwelling place in one of the Makapansgat rock shelters. To my mind, the colour of the cobble was a very significant aspect. According to Sir James Fraser, in a number of creation myths the first men were modelled out of red clay or earth. Red is the colour most attractive to the Hominoidea, i.e. apes and men. Anyone who doubts this should try offering a tray of boiled sweets, each of a single colour, to a group of children, and the marked preference in favour of selecting the red ones will soon become evident.

While D. Morris was carrying out his intensive painting experiments with the young male chimpanzee Congo, when this ape showed signs of becoming tired of the activity, Morris found that, on offering him a brush that had been dipped in red paint, Congo showed a slight but definite preference for this colour, and continued painting for a further spell, as though this colour supplied a boosting effect that the colour blue, for example, did not.

We all know about the extensive use of red ochre by the Upper Palaeolithic cave artists, mainly 30–12 ka ago; we also know that Neanderthal man (with Mousterian culture, Middle Palaeolithic) made some use of red ochre and occasionally pieces of the black pigment, manganese dioxide. However, it came as a surprise when de Lumley, in his excavations of the coastal rock shelter at Terra Amata, near Nice, found in association with the earliest known European Acheulian culture 75 shaped pieces of red ochre (de Lumley 1978). The deposits at Terra Amata are considered to be of late Mindel age (0.3 Ma B.P.). One might say the hunt is now on for earlier evidence of hominid interest in pigments, particularly red mineral pigments, because the use of such material is unlikely to have had any value other than symbolic. The power of this symbolism may be gauged by the lengths to which Australian aborigines will go to obtain red ochre for use in their rituals. Sollas (1924, p. 278) says:

Howitt tells us of one tribe (Dieri) that at certain times of the year dispatched an expedition of 70 or 80 picked men under experienced leaders, who, if necessary, fought their way across country to the ‘mines’, some 300 miles off... The ochre is dug out of the ‘mine’ and kneaded into large cakes weighing, when dry, from 70 to 80 lbs[†]. The men carry this away on their heads.

One might say that to the ‘stone age mind’ red ochre played a role not unlike that played by gold in the civilized world of today.

As the base of Acheulian culture is probably a diachronic horizon it is highly likely that the use of red ochre occurred in Africa considerably earlier than that represented at Terra Amata. In this connection the words published by Clark & Kurashina (1979) are worth quoting. They were describing the oldest known Acheulian hand axe occupation site at Gadeb on the South-East Plateau of Ethiopia. ‘The occupation floor... yielded several fragments of heavily weathered basalt which, when rubbed, give a red pigment. None of the pieces show unquestionable evidence of rubbing, but the possibility should not be ignored’. Later they concluded: ‘*Homo erectus*, even at this unusually early time (1.5 Ma ago) may have been experimenting with pigment’. In dealing with incipient use of red pigment, one should not confine one’s attention to red ochre. Leakey (1958) recorded that in excavation of the Chellean I (now regarded as Early Acheulian) occupation site at BK in Olduvai Bed II he found two ‘lumps of

† 1 lb (pound)  $\approx$  0.45 kg.

red ochre which clearly were brought to the site by man, thus suggesting that even in Chellean I times man was interested in colouring matter'. After subsequent mineralogical examination the two lumps proved to be reddened volcanic tuff, and not red ochre, and consequently I believe that an important discovery has since been overlooked. Was not Leakey's discovery in fact comparable with the finding by Clark & Kurashina on the floor at Gadeb of weathered basalt that on being rubbed gave a red pigment?

The probability is that interest in mineral-red pigment marked an important threshold in the hierarchy of evolving human minds. Did it perhaps coincide with speech and the beginnings of social organization in the cultural evolution of *Homo* (Wreschner 1976)? Unendowed with natural ornamentation apart from the glories of head hair, man may well have turned to artificial colouring of his skin and apparel as soon as tribes, moieties and family groups were formed and required to be distinguished when sighted at a distance.

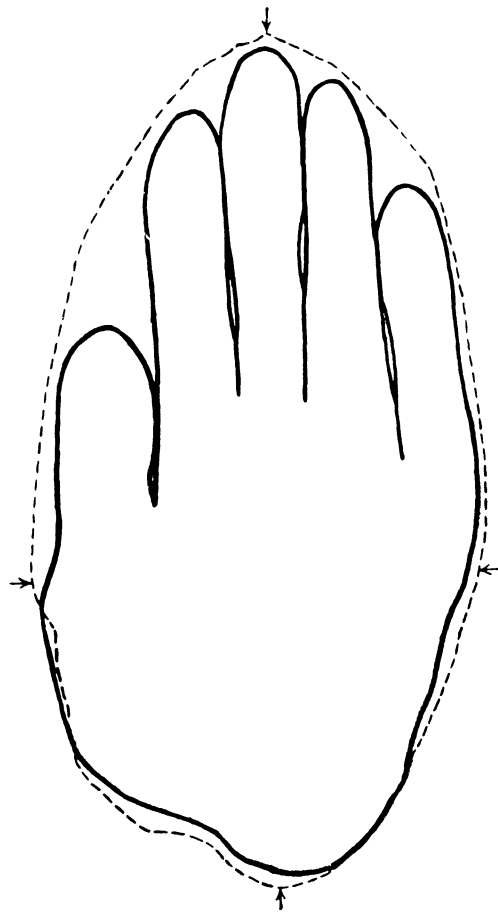


FIGURE 1. Outline of long-ovate Acheulian flint hand axe 20.4 cm long, overlain by outline of adult human hand. After R. R. Schmidt (1936).

Apart from the use of red mineral pigments in Acheulian times, there are other indications of the use of symbols (cf. Edwards 1978) and symbolic thought over this long hand-axe period, which eventually included the transition from *Homo erectus* to hominids belonging to a primitive subspecies of *Homo sapiens* (e.g. Swanscombe man). One only has to consider the conceptual nature of the bifacial hand axes, characteristic of the Acheulian culture, and compare them

with the tool kit of the Oldowan culture that preceded them, to realize at once that the introduction of the Acheulian biface hand axe was a major innovation. The Acheulian hand axe was a general purpose tool widely used in Africa, southwest Asia and Europe for hundreds of thousands of years, and was evidently designed by means of a sort of symbolic logic. Schmidt (1936) showed that the bifacial hand axe was based on the human hand as model (figure 1). With the onset of symbolic thought, a bifacial hand axe was perhaps subconsciously visualized as representing a third hand, a hand that unlike the flesh-and-blood original had the capability to cut and skin the carcasses of the animals scavenged or hunted.

There are a few exceptional Acheulian artefacts that, through an adventitious element in the stone of which they were made, served the artistic mind's eye to distinguish them in the way that a blazon does on a sword hilt.

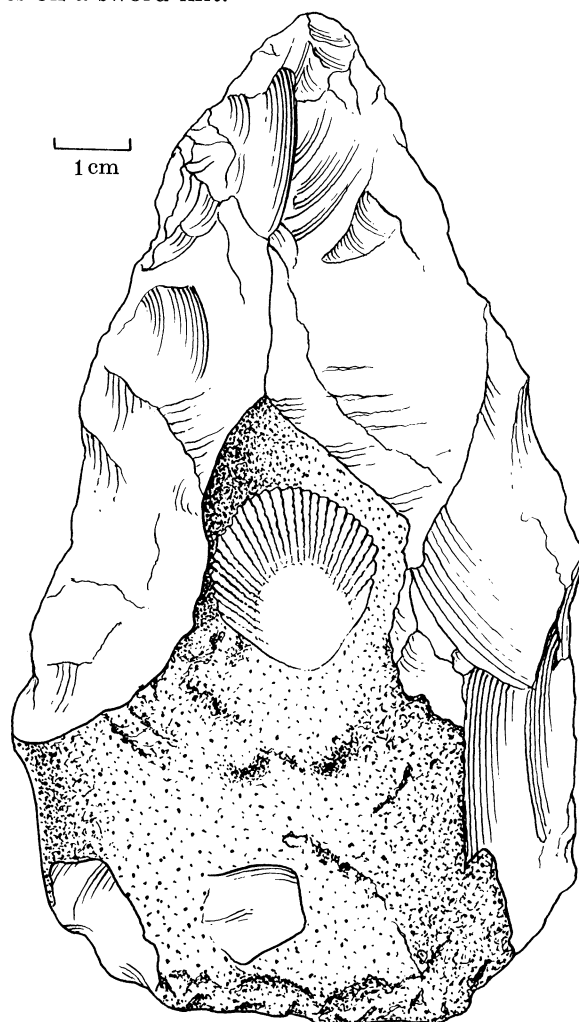


FIGURE 2. Pointed Acheulian hand axe of flint showing one valve of embedded shell of Upper Cretaceous bivalve mollusc, *Spondylus spinosus* (J. Sowerby). West Tofts, Norfolk (length 13.5 cm). By courtesy of the Curator, University Museum of Archaeology and Ethnology, Cambridge; *del.* M. O. Miller.

In the first example (figure 2) a fossil bivalve mollusc shell in the flint served as a blazon unique to the owner. This hand axe was found at West Tofts, Norfolk. The important fact emerged from examining the hand axe that the fossil was on a weathered portion of the block of flint out of which the tool was fashioned. We may infer that the fossil in its exposed state was noticed before the block of flint was selected, and also that as the toolmaker worked

this block into the pointed biface he deliberately took care to avoid flaking the area that bore the fossil, thus leaving it to occupy a central position on one face of the completed hand axe. This specimen was called to my attention by R. J. MacRae of Oxford, who had noted it while going through the collections of hand axes in the University Museum of Archaeology and Ethnology, Cambridge, U.K. A note on and an illustration of this hand axe appear in Oakley (1973).

Following the publication of the note on the West Tofts hand axe I received a letter from D. Downes of the City of Liverpool Museums† informing me that in their Archaeological Collections there was an Acheulian flint hand axe from the Middle Gravels at Swanscombe that had a conspicuous fossil echinoid of the type commonly known as a shepherd's crown embedded in the flint (figure 3). The fossil echinoid, a flint mould, is remarkably large in relation to the size of the implement, measuring 37 mm in diameter, which is nearly two-fifths of the length of the whole implement. Although the fossil has been slightly chipped along the left margin, it was evidently intended to be the central feature of the tool. It is difficult to speculate on what significance this fossil had in the mind of the toolmaker who fashioned the implement about 0.2 Ma ago. Perhaps the most striking aspect of the fossil was its five-fold symmetry, marked by five pairs of grooves (the ambulacral areas) that intersect at the centre to form a star. Archaeological findings and folklore indicate clearly that in the Celtic Iron Age and probably earlier flint shepherd's crowns were regarded as thunder stones, supposedly hurled down from the sky by a god such as Thor of the Norse mythology. Flint moulds of echinoids are most often seen on field surfaces when soil derived from the Chalk has been washed by a heavy rainstorm; so it is not improbable that the idea that these objects had fallen from the sky readily sprang to the mind of the untutored finder, particularly when the storm had been accompanied by lightning and the consequent thunder.

Perhaps the most strange example of stone with fossil structures that attracted Acheulian man takes us again to the gravels at Swanscombe that yielded the three bones of the fossil skull now referred to *Homo sapiens steinheimensis*. Alvan Marston, who discovered the first two bones of that skull, also found in the same Middle Gravels two pieces of chert containing a fossil compound coral of a kind usually found in calcareous rocks of Jurassic age. Both flakes have an ochreous stain, like many of the flints in the Swanscombe Gravels. They show conchoidal fractures of a kind indicating that they had been struck from the parent chert by man. No outcrops of such coral-bearing chert are known to occur in the catchment area of the Lower Thames, which deposited the Swanscombe Gravels. We can only infer that these flakes were manuports, that is to say, they had been transported by Acheulian hunters from a distant source. Evidently this exotic chert, wherever it outcropped, was valued by the Acheulian hunters as precious stones would be today. When the macroscopic characters of the fossil coral in these flakes were first examined they were identified as those of *Isastraea oblonga*. When thin sections of them were studied microscopically by the Polish authority on Jurassic corals E. Roniewicz, she confirmed that one of the flakes did belong to that species, although she referred it to a new genus *Pseudodiplocaenia* (figure 4). The second and larger flake Oakley 1971, p. 582, pl. IA) showed features unrecorded in any known Jurassic coral. At first she intended to use this Acheulian flake as the holotype of a new genus and species, but on more detailed study she found that certain critical structures were too imperfectly preserved to justify this course of action. She did find, however, that the mineralization of the two flakes was the same, and so she had no doubt that they had all come from the same source.

† Now known as Merseyside County Museums (p. 6).

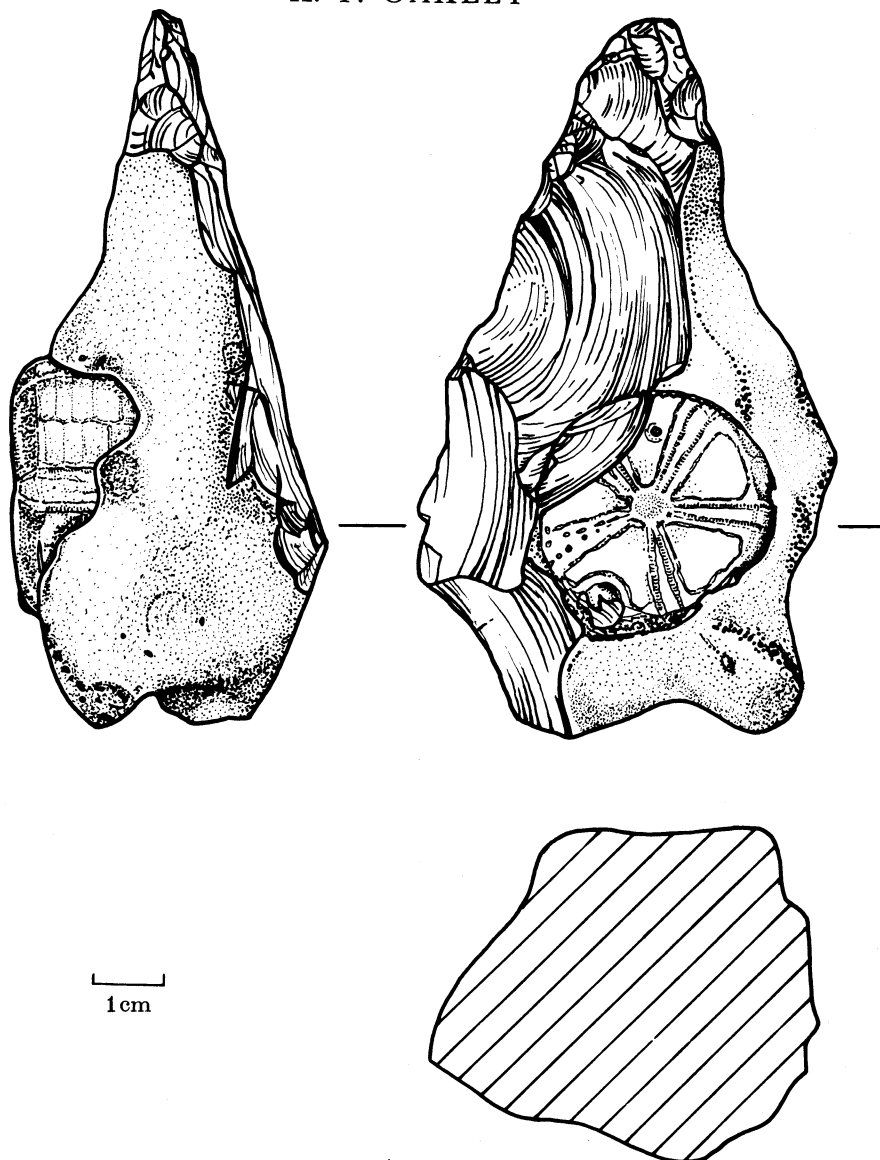


FIGURE 3. Pointed Acheulian hand axe of flint with an embedded Upper Cretaceous echinoid, *Conulus* sp. *Left*, right edge of hand axe showing side of echinoid; *right*, hand axe viewed from above, with oral surface of echinoid exposed (mouth central, anus marginal half-left); *below*, cross section of hand axe. Middle Gravels, Swanscombe, Kent (length 9.5 cm). By courtesy of the Director, Merseyside County Museums. Reg. no 42.17.237. *del.* M. H. R. Cook.

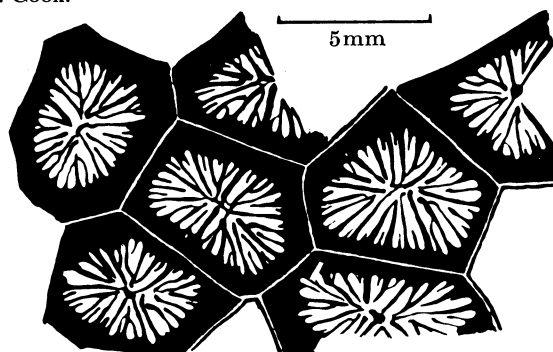


FIGURE 4. Transverse section of the Upper Jurassic coral *Pseudodiplocaenia oblonga* (Fleming). Drawing based on silicified corallum in pale grey chert from Portlandian beds, Tisbury, Wiltshire. Reproduced by courtesy of E. Roniewicz.

There is only one location in Britain where coral-bearing chert containing *Pseudodiplocaenia oblonga* is known to occur, namely the Portlandian beds outcropping at Tisbury in Wiltshire, about 120 miles (193 km) from Swanscombe.

As regards numeracy in the thought of Acheulian man, it may be worth noting that on the average the corallites in *P. oblonga* are five-sided polygons. What could the pattern presented by these corals have symbolized in the thoughts of Swanscombe man? The only possible clue that we have is in the widespread folk name for fossil compound corals of this kind; they are known as starry stones. Is it conceivable that even 0.2 Ma ago they called to mind the night sky?

#### SUMMARY

If the reddish, face-featured pebble of jasperite from Makapansgat, Transvaal, is accepted as a manuport, the roots of art can be assessed as going back at least 3 Ma. In east Africa at the stage of the earliest Acheulian hand-axe culture, 1.5 Ma B.P., *Homo erectus* had developed an interest in red mineral pigments. At the same cultural stage, but in the Riviera, 0.3 Ma B.P., true red ochre was regularly used by *H. erectus*, possibly for body decoration (rock art is unknown before 0.03 Ma B.P.). English examples of Middle Acheulian flint hand axes, 0.2 Ma B.P., are described in which an ornate fossil in the raw material has been preserved as a feature of the finished tool. Flakes of chert containing a starry fossil structure appear to have been transported 120 miles (193 km) by the Middle Acheulian men of Swanscombe. It is inferred that in the transition from *H. erectus* to early *H. sapiens* 'art as a human behaviour' (Dissanayake 1980) was emerging.

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#### REFERENCES (Oakley)

- Clark, J. D. & Kurashina, H. 1979 Hominid occupation of the east-central highlands of Ethiopia in the Plio-Pleistocene. *Nature, Lond.* **282**, 33–39.
- Dart, R. A. 1974 The waterworn australopithecine pebble of many faces from Makapansgat. *S. Afr. J. Sci.* **70**, 167–169.
- Dissanayake, E. 1980 Art as a human behavior: towards an ethological definition of art. *J. Aesthetics Art Criticism* **38**(4), 397–406.
- Edwards, S. W. 1978 Nonutilitarian activities in the Lower Palaeolithic: a look at the two kinds of evidence. *Curr. Anthropol.* **19**, 135–137.
- Frazer, J. G. 1923 *Folklore in the Old Testament* (abridged). London: McMillan.
- Leakey, L. S. B. 1958 Recent discoveries at Olduvai Gorge, Tanganyika. *Nature, Lond.* **181**, 1099–1103.
- Lumley, H. de 1978 Les fouilles de Terra Amata à Nice. Premiers résultats. *Bull. Mus. Anthropol. préhist. Monaco* **13**, 29–51.
- McFadden, P. L., Brock, A. & Partridge, T. C. 1979 Palaeomagnetism and the age of the Makapansgat hominid site. *Earth planet. Sci. Lett.* **44**, 373–382.
- Morris, D. 1962 *The biology of art*. London: Methuen.
- Oakley, K. P. 1971 Fossils collected by the earlier palaeolithic men. In *Mélanges de préhistoire, d'archéocivilization et d'ethnologie offerts à André Varagnac*, pp. 581–584. Paris: Serpen.
- Oakley, K. P. 1973 Fossil shell observed by Acheulian man. *Antiquity* **47**, 59–60.
- Schmidt, R. R. 1936 *The dawn of the human mind*. London: Sidgwick & Jackson. (Transl. R. A. S. Macalister from R. R. Schmidt, *Der Geist der Vorzeit*.)
- Sollas, W. J. 1924 *Ancient hunters and their modern representatives* (3rd edn). London: Macmillan.
- Wreschner, E. E. 1976 The red hunters: further thoughts on the evolution of speech. *Curr. Anthropol.* **17**, 717–719.