On the Archaeological Association of the Fossil Hominid from Hathnora, Madhya Pradesh, India

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INTRODUCTION

THE NARMADA RIVER originates at Amarkantak (22°40′N, 81°40′E) in eastern Madhya Pradesh and flows for about 1300 km before emptying into the Gulf of Cambay near Broach in Gujarat. Deposits between Bedaghat (23°08′N,79°47′E) and Hoshangabad (22°45′N,77°45′E), rich in Pleistocene vertebrate fauna and Palaeolithic artifacts, have interested Quaternary geologists, palaeontologists, and archaeologists for over a century (Theobald 1860; Blanford 1869; Pilgrim 1905; De Terra and Paterson 1939; Khatri 1961; Supekar 1968; Badam 1979*a*; Biswas and Dassarma 1981; Badam and Salahuddin 1982). The discovery of a fossil hominid skull cap of *Homo erectus narmadiensis* by Sonakia (1984) at Hathnora (22°52′N,77°53′E), c. 40 km northeast of Hoshangabad (Fig. 1), sparked great interest among palaeoanthropologists in India and abroad. In February 1985, we conducted an exploration to evaluate the association of a prehistoric stone tool assemblage found at the fossil hominid site and the assemblage's probable age. A new understanding of the stratigraphy at the site was brought to light.

GENERAL STRATIGRAPHY OF THE CENTRAL NARMADA VALLEY

Since the time of the first systematic work on fossils, conducted by Theobald (1860), a large number of scholars have contributed to the understanding of the stratigraphy of the area (De Terra and Chardin 1936; De Terra and Paterson 1939; Sen and Ghosh 1963; Khatri 1966). The general stratigraphy of the Narmada alluvium is represented in Table 1.

The Narmada alluvium has been divided into two groups: (1) a lower group of Middle Pleistocene to early Upper Pleistocene age (150,000–40,000 B.P.) (Joshi et al. 1981; Badam 1979*b*, 1982); and (2) an upper group that is dated to the Upper Pleistocene on the basis of a radiocarbon date of 31,750 +1820 −1625 B.P. (Agrawal and Kusumgar

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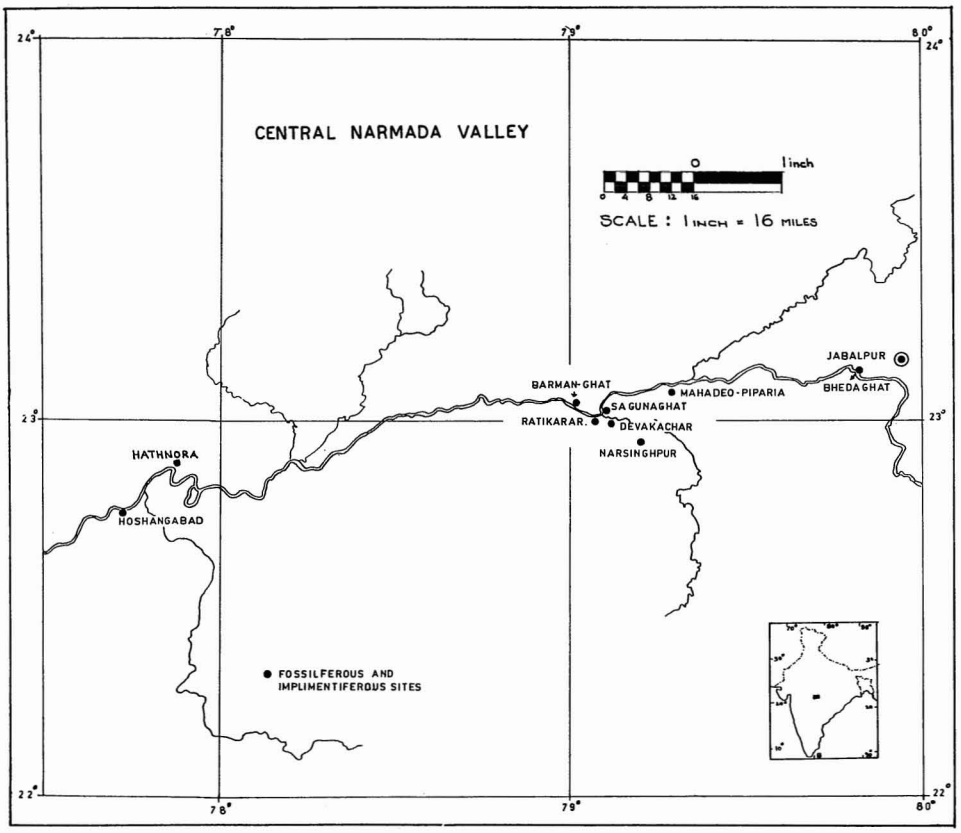


Fig. 1. Locality map of Central Narmada Valley.

1974), fluorine/phosphorus ratio (3.2–8.16) of bones (Joshi 1985), nitrogen analysis of bones (0.97–1.20%) (Badam 1979*a*) and faunal data (Badam 1979*b*; Biswas and Dassarma 1981). The nitrogen bone tests were carried out by Dr K. P. Oakley (pers. comm.) on two fossil bones from the Upper Narmada Group.

When the bore hole data presented by Supekar (1968), in which gravel layers at intervals of 21.65 m, 29 m, 39 m, and 76.5 m below surface were tapped, it seems that the proximity of suitable lithological (e.g., Bogra Conglomerates) and topographical (e.g., Vindhyan Escarpment) features has been responsible for the strata building of the valley. This is further supported by the presence of cemented, bouldery, gravel bed in the proximity of the Narmada River and by fine sand and silt, as its homotaxis, in the river's tributaries. Such variation in the lithological composition within the valley is better explained by the lateral migration of the river. Therefore, a comprehensive stratigraphy of the valley involves a detailed study of the subsurface alluvium, which should yield interesting results.

STRATIGRAPHY AT HATHNORA

The site proper is situated on the northern bank of the Narmada River c. 40 km northeast of Hoshangabad. A thick deposit of c. 15 m exposed at the site is divisible into

TABLE 1. COMPOSITE LITHOSTRATIGRAPHY OF THE CENTRAL NARMADA VALLEY

THEOBALD (1860)		DE TERRA AND PATERSON (1939)			KHATRI (1966)
PLIOCENE		MIDDLE PLEISTOCENE			HOLOCENE TO MIDDLE PLEISTOCENE
Upper group	Black cotton soil	Younger alluvium	Cotton soil group	Black cotton soil	Yellow silty + modern soil
	Pale brownish alluvium			Basal gravel	Yellow cross-bedded sand
	Irregular beds of sand and conglomerate		—disconformity—		Cemented sandy gravel
		Older alluvium	Upper group	Upper pink concretionary clay	Red clay/boulder conglomerate
Lower group	Red-yellow clay			Upper gravel sand	
	Boulder conglomerate		—disconformity—		
			Lower group	Lower red concretionary clay	
				Basal conglomerate	
			—disconformity—		
				Laterite gravel and soil	

SUPEKAR (1968)	BADAM (1979*b*)	BISWAS AND DASSARMA (1981)
EARLY UPPER PLEISTOCENE	EARLY UPPER TO LATE MIDDLE PLEISTOCENE	UPPER PLEISTOCENE
Black cotton soil	Dark brown consolidated silt and gravel	Black cotton soil
Yellow-brown kankerised silt		Gray silt
Sandy pebbly gravel	Yellow-brown calcreted silt, sand and gravel	Pedocol layer
		Gray sand w/lime concretions
Red-brown concretionary silt	Reddish brown calcareous silt	
Boulder conglomerate	Cemented boulder gravel	Pinkish clay and silt, lime concretions
		Grit and sand
		Boulder bed
		Deep red clay
		Deep red boulder bed

five lithological units (Fig. 2). The basal unit, about 1.5 m thick, comprises cemented grayish cross-bedded sand with matrix-supported pebbles at the top. This unit is conformably overlain by cemented bouldery/pebbly gravel c. 0.5 m thick and is what yielded the partial fossil hominid skull (Sonakia 1985). Late Acheulian tools and remains of fossil bovids and proboscidea were collected from the same horizon during the February 1985 exploration. This unit grades into unconsolidated sandy/pebbly gravel c. 5 m

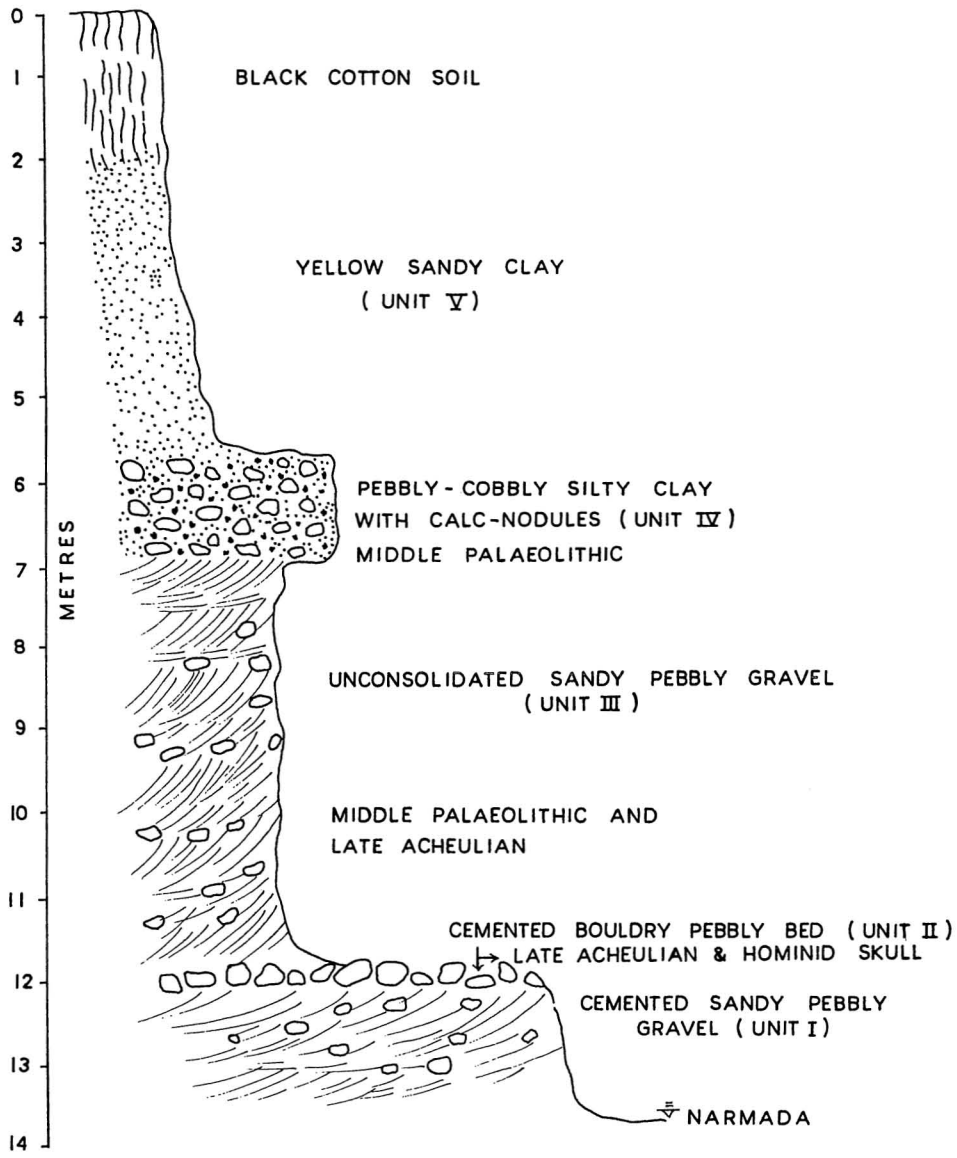


Fig. 2. Lithosection at Hathnora.

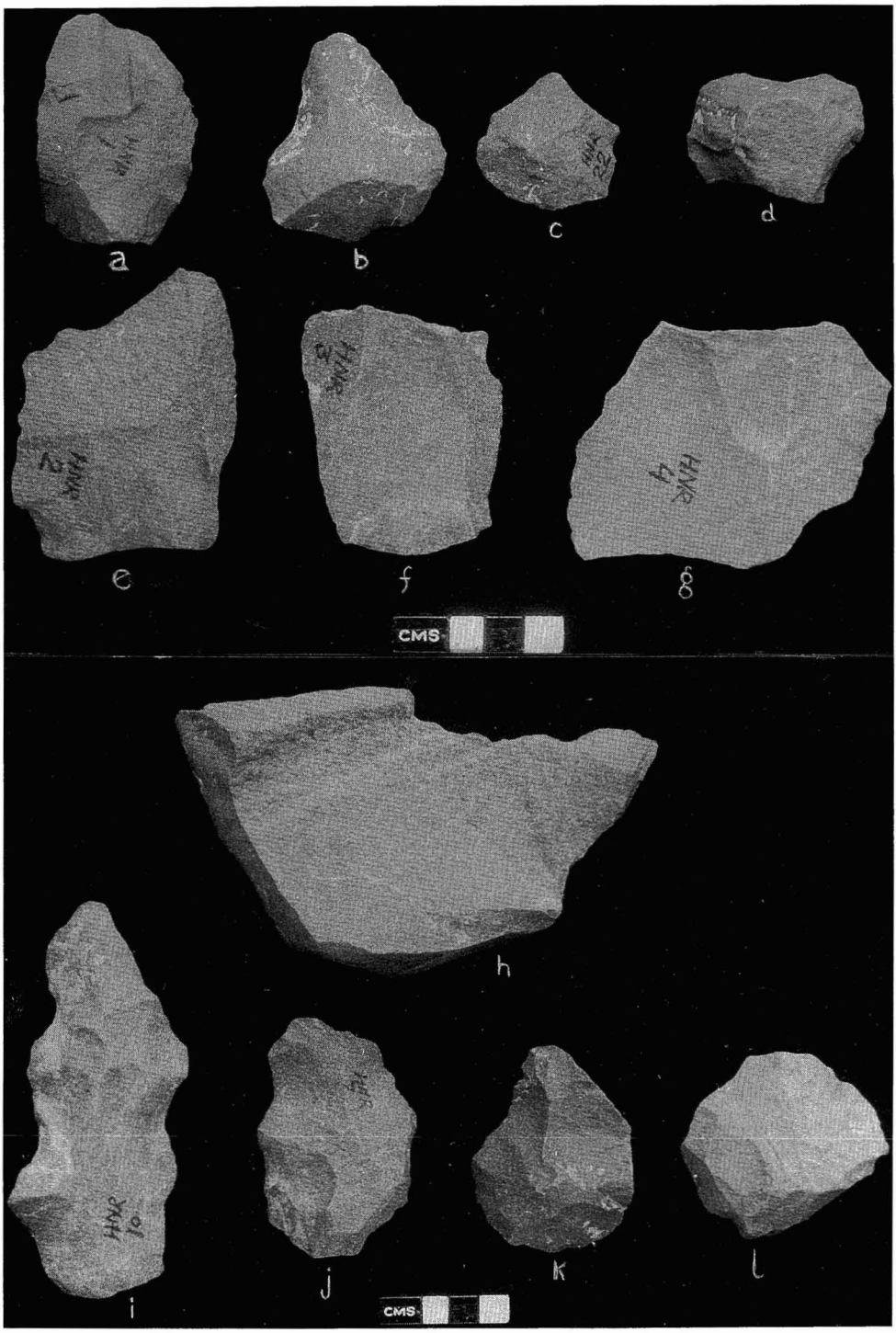
thick, having subrounded to rounded and unimbricated matrix-supported pebbles and gravels. A rich faunal collection has been made from this unit elsewhere in the Central Narmada Valley, along with Middle Palaeolithic tools and Late Acheulian artifacts (Table 2). Over this unit lies pebbly/cobbly and silty clay, c. 2 m thick, with calc-nodules yielding Middle Palaeolithic artifacts. Capping it is yellow, silty clay 4 m thick that, in turn, is overlain by black cotton soil.

PREHISTORIC ARCHAEOLOGY AT HATHNORA

The cemented bouldery gravel bed, a sheet deposit, has yielded Early to Middle Acheulian tools elsewhere in the Central Narmada Valley (Misra 1975–1976), but only

TABLE 2. FAUNA FROM THE CENTRAL NARMADA VALLEY IN ASSOCIATION WITH LOWER AND MIDDLE PALAEOLITHIC CULTURES

ORDER	DE TERRA AND PATERSON (1939)	COLBERT (1942)	SEN AND GHOSH (1963)	KHATRI (1966)	SUPEKAR (1968)	BADAM (1976)	BADAM AND SALAHUDDIN (1982)
Carnivora	—	*Holaractus namadicus*	—	—	—	—	—
Perissodactyla	—	*Rhinoceros unicornis*	—	—	—	—	—
	Equus namadicus	*Equus namadicus*	*Equus namadicus*	*Equus namadicus*	*Equus caballus*	*Equus namadicus*	*Equus namadicus*
Artiodactyla	*Hexaprotodon namadicus*	*Hippopotamus namadicus*	*Hippopotamus namadicus*	*Hexaprotodon namadicus*	*Hexaprotodon namadicus*	—	*Hexaprotodon namadicus*
	—	*Hippopotamus palaeindicus*	*Hippopotamus palaeindicus*	—	—	*Hexaprotodon palaeindicus*	*Hippopotamus palaeindicus*
	Bos namadicus	*Bos namadicus*	*Bos* sp.	*Bos namadicus*	*Bos namadicus*	*Bos namadicus*	*Bos namadicus*
	Bubalus palaeindicus	*Bubalus palaeindicus*	*Bubalus* sp.	*Bubalus palaeindicus*	*Bubalus palaeindicus* or *Bu. bubalis* or *Bos* sp.	*Bubalus* sp. (probably *Bu. bubalis*)	*Bubalus* sp.
	—	*Leptobos frazeri*	—	—	—	—	—
	—	—	—	*Bison* sp.	—	—	—
	—	—	—	—	—	—	*Bibos* sp.
	—	*Cervus duvauceli*	—	*Cervus* sp.	—	*Cervus duvauceli*	*Cervus duvauceli*
	Sus sp.	*Sus namadicus*	*Sus* sp.	*Sus* sp.	—	—	—
Proboscidea	—	*Stegodon insignis*	—	—	*Stegodon insignis*	*Stegodon insignis*	—
	—	*Stegodon ganesa*	—	—	—	*St. ganesa*	—
	Elephas namadicus	—	*Elephas namadicus* or *El. maximus*	*Elephas namadicus (antiquus)* or *El. maximus (indicus)*	—	*Elephas maximus*	*Elephas* sp.
	—	*Palaeoloxodon namadicus*	—	—	—	—	—
Reptilia	—	—	—	—	—	*Crocodylus palaeindicus*	—
	Trionyx sp.	—	—	—	—	*Trionyx* sp.	*Trionyx* sp.
	Emys sp.	—	—	—	—	—	—



Pl. 1. (See explanation on facing page.)

Explanation of Plate 1

a End flake; prepared platform; well dressed dorsally: 60 × 41 × 16 mm.
b Scraper on end flake; prepared platform; edges retouched to produce scraping edge: 55 × 47 × 22 mm.
c End flake; prepared platform; ventrally bulb of percussion small and defused: 36 × 37 × 12 mm.
d Side scraper on indeterminate flake; well dressed edges: 44 × 40 × 22 mm.
e Side flake; simple platform; dorsally secondary flake scars: 74 × 54 × 18 mm.
f End flake (broken); simple platform; ventrally bulbar scar present.
g Flake (broken); prepared platform; bulb of percussion small and defused.
h Side flake; simple platform; dorsally deep negative bulb of percussion; laterally cortex retained: 160 × 96 × 37 mm.
i Elongated core; ventrally and dorsally deep flake scars: 137 × 54 × 27 mm.
j Amorphous core; ventrally and dorsally flaked: 82 × 54 × 25 mm.
k Amorphous core; ventrally and dorsally flaked; cortex retaining ventrally: 71 × 57 × 33 mm.
l Discoidal core; ventrally and dorsally flaked; negative bulbs of percussion deep; little cortex retaining: 65 × 57 × 32 mm.

Late Acheulian tools have been found at Hathnora. Tools of the Middle Stone Age reported from this bed elsewhere (Supekar 1968; Khan 1972), have been assigned a greater antiquity than the Middle Stone Age tools of the overlying unconsolidated sandy/pebbly gravel. Such occurrences of scrapers and small tools in association with Acheulian and pebble tools are also reported from other Old World sites (Sankalia 1978; Le Colle 1984; Corvinus 1983).

The Late Acheulian tools collected from the cemented bouldery/pebbly bed at Hathnora, though very small in number, are significant in that they have been collected from the hominid yielding bed and are in association with fossils. The artifacts are made of red Vindhyan sandstone. Typologically the tool kit comprises amorphous cores (Pl. 1j,k), a discoidal core, side flakes (Pl. 1e), end flakes (Pl. 1a,c,f,g), indeterminate flake, and scrapers. The cores are small in size (average length, breadth, and thickness 88 mm, 55 mm, and 28 mm, respectively) and have several small flake scars with negative bulbs of percussion. One of the cores (Pl. 1i) is elongated and comparatively thin, with alternate flake scars on both sides, thus appearing as a handaxe. The discoidal core (Pl. 1l) is more or less round in shape and flaked along the periphery and its central portion. Flakes are thin and well dressed with small flake scars on the dorsal side. A few flakes have a prepared platform. Most of them are more or less symmetrical with no cortex; one is comparatively large (Pl. 1h), having deep negative and positive bulbs of percussion on its dorsal and ventral sides, respectively. The other flakes have small and defused bulbs of percussion, indicative of the cylinder hammer technique. Of two scrapers in the assemblage, one is made on an end flake (Pl. 1b) and the other is made on an indeterminate flake (Pl. 1d). Both are concave, very well dressed and thin, with a small and defused bulb of percussion.

The assemblage in question defines all the requisite characters of the Late Acheulian industry (e.g., Issac 1969; Misra 1975–1976; Paddayya 1977). The tools are thin and symmetrical compared to the Early and Middle Acheulian tools; they have small and shallow flake scars, very little cortex, and prepared platforms. All these characters are indicative of cylinder hammer technique.

STATUS OF LATE ACHEULIAN IN INDIA

Owing to the absence of any stratified context of the prehistoric tools in India, it is difficult to segregate the Late Acheulian complex from that of the Early and Middle Acheulian. The tools are generally collected from the surface where both complexes lie on a par with each other. Typological differentiation must be considered in the segregation of tool complexes and the establishment of a cultural chronology.

The Hathnora tool kit could be compared typo-technologically to the Late Acheulian industries of Cuddapah (Raju 1981), Tirupati Valley (Jacob 1983), Raisen (Jacobson 1975), Wainganga group A (Joshi 1966), and Jethian Valley (Sankalia 1974). The only report of the Mousterian facies of the terminal Acheulian tradition is from the stratified context at Bhimbetka (Misra 1975–1976). The Late Acheulian from Gangapur (Upper Godavari Valley) is relatively dated, on the basis of geomorphological evidence, to the late Pleistocene (Kumar 1985).

LATE ACHEULIAN OUTSIDE INDIA

The most well-known site of a Late Acheulian hominid is that of Kolombo Falls on the Zambian–Tanzanian border. It is dated to >190,000 B.P., which is in agreement with material from Isimila in central Tanzania, where the Acheulian from stratified context is dated to 260,000 B.P. The Upper Acheulian from Olorgesailie lake beds and Mesak beds (top of Olduvai sequence) are dated to 450,000 B.P. and 400,000 B.P., respectively (Clark 1976). It is unlikely that any of these assemblages is older than 700,000 years or earlier than 125,000 years ago. The evidence suggests that the evolved form of Acheulian continued until somewhere between 125,000 and 115,000 years ago (Clark 1981).

Fossil hominids, two females and one male from Steinheim (Germany), Swanscombe (England), and Arago (France), represent an anatomically archaic form of *Homo sapiens* that spans the time between the appearances of *Homo erectus* and *Homo sapiens* (Haviland 1979). The Saldanha skull found at Elandsfontian in the Cape Province of South Africa in association with Late Acheulian artifacts is designated as archaic *Homo sapiens* (Singer and Wymer 1968; Rightmire 1983). The discoveries of the Bodo skull from Ethiopia (Conroy et al. 1978; Kalb et al. 1982) and the Lake Ndutu skull from northern Tanzania (Clark 1976; Mturi 1976), both archaic *Homo sapiens,* have also been made in association with a Late Acheulian assemblage.

Three Acheulian sites in northwestern Africa (Casablanca, Robot, and Ternifine) are associated with *Homo erectus.* On the basis of an analogy with East Africa, it seems likely that *Homo erectus* manufactured the earlier Acheulian artifacts, and the later ones were shaped by archaic *Homo sapiens* (Rightmire 1976). The fossil *Homo erectus* specimens from Java, China, Lake Turkana and Olduvai Gorge (East Africa), Swartkrans (South Africa), Ternifine (North Africa), and Vertesszöllos (Hungary) are dated between 1.5 m.y. and 400,000 years ago (Deacon 1975).

Clear evidence from North Germany to East Africa pointing to the presence of *Homo sapiens* during the terminal Middle Pleistocene and of *Homo erectus* in the Middle Pleistocene leaves no doubt that archaic *Homo sapiens* evolved from *Homo erectus* (Jurmain et al. 1984). The morphological characters also point to the derivation of *Homo sapiens* from *Homo erectus.* The timing is disputed (? 500,000–400,000 B.P.), which favors contemporaneity of these different species of hominids (Rightmire 1981).

HATHNORA: SEAT OF *ERECTUS* OR *SAPIENS*?

The occurrence of Late Acheulian tools in the base of the bouldery/pebble bed (and at no other level) and the presence of Late Acheulian tools along with Middle Palaeolithic tools in the immediately overlying unconsolidated sandy/pebbly gravel clearly indicate a cultural succession at the Hathnora site and the contemporaneity of the Late Acheulian and Middle Palaeolithic cultures.

We considered the archaeological chronology, typo-technological similarities, vertebrate faunal assemblage, and geomorphology of the site and assigned the fossil hominid bearing bed a late Middle Pleistocene to early Upper Pleistocene age. The makers of these tools at the site may be anatomically archaic *Homo sapiens* and not *Homo erectus.*

The association of archaeological material with the hominid fossil may not be taken as a criterion for identifying the taxon, as rightly pointed out by Kennedy (1985). However, a review of the associated hominid remains from various Late Acheulian sites all over the world, as given in the earlier pages, suggests the association of archaic *Homo sapiens* with the culture. This association may hold true for the Narmada hominid skull as well.

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