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The Pleistocene Mammalian Fossils of the Narmada River Valley and Their Horizons

A. P. KHATRI

Introduction

This paper is a preliminary account of the Pleistocene mammalian fauna of the Narmada, based on the writer's collection accumulated since 1958. This study also attempts to work out the stratigraphy of the ancient alluvium to place the fossil beds in their proper sequence. The study has revealed that the Narmada fossils cannot be lumped together, placed under a single label of 'Narmada group' and called Middle Pleistocene, as is being done. Similarly, the fossils from several horizons cannot be equated with those of the Boulder Conglomerate Zone (Colbert 1935) of the Shiwalik foothills of the Himalayas. In fact, the Narmada's richest fossiliferous bed, the yellowish or pinkish cross-bedded sand as exposed at Devakachhar (Pl. II*a*), is Upper Pleistocene (Khatri 1961), and is associated with the Late Acheulian stage (Khatri 1963*a*) of the Hand Axe culture. It appears that the Narmada acted as a backwater sanctuary for animals whose survival was threatened in other areas of the subcontinent by such factors as climatic fluctuation. A thorough study of the collection may reveal the exact stratigraphic ranges of the various species within the sequence of deposits, due to good stratigraphical control of the data while collecting.

Historical Note

The first discovery of mammalian fossils in the Narmada Valley was made at Jabalpur by a Captain Sleeman in 1830. The credit for bringing this discovery to light goes to Dr. G. G. Spilsbury of the Bengal Medical Establishment, then stationed at Jabalpur. He conveyed this news to James Prinsep, the Secretary of the Asiatic Society of Bengal, who in turn published it (Prinsep 1832). Dr. Spilsbury also published the first drawing of a vertebrate fossil from India. It was that of an elephant jaw from the Umar Nadi (Omar Nadi), a sub-tributary of the Narmada (Spilsbury 1833). Spilsbury continued to make collections (1833–41) and published reports of them in the *Journal of the Asiatic Society of Bengal.* He was repeatedly encouraged in this endeavor by James Prinsep. That very decade, Dr. Hugh Falconer, an assistant surgeon of the East India Company, announced his find of vertebrate fossils—tortoise shells—in the Shiwaliks (Siwaliks) of Dehra Dun.

W. Theobald (1860) published the first account of the stratigraphy of the Narmada's ancient alluvium. He collected many fossils and listed several fossiliferous sites. Mr. C. A. Hacket's name is associated with the discovery of the first prehistoric tool from the Narmada, a beautiful hand axe made of quartzite from Bhatera (Bhutra) on the Narmada near Gadarwara. An account of this implement was published by H.B. Medlicott (1873). From the valley, Hacket discovered many fossils which can be seen in the Palaeontological Gallery of the Indian Museum at Calcutta. Medlicott maintained (1873) that they date from the Upper Pleistocene; Falconer thought them to be of the Pleiocene. Vredenburg (1906) studied the irregularities of the gradient of the Narmada, Tapti, Godavari, Purna and Mahanadi, and suggested that they are products of Pleistocene movements which occurred in peninsular India.

R. Lydekker (1880, 1882, 1884 *a-b*) and G. E. Pilgrim (1905) published an account of the Narmada fossils along with the Shiwalik fossils, but no other work is extant. The Yale-Cambridge expedition, under the leadership of Helmut De Terra, visited the valley for a fortnight in 1935 and explored the fossiliferous localities already mentioned by Theobald. They attempted to correlate the deposits of the Narmada with the Shiwaliks and interpreted the Stone Age evidence from the Narmada in terms of Sohanian culture (De Terra and Paterson 1939). There ensued a lull in research until 1958, when the writer started exploring this valley and published several papers regarding stratigraphy and prehistory (Khatri 1961, 1962, 1963*a-b*, 1964). An Oldwan pebble-tool horizon called 'Mahadevian' was discovered. *In situ*

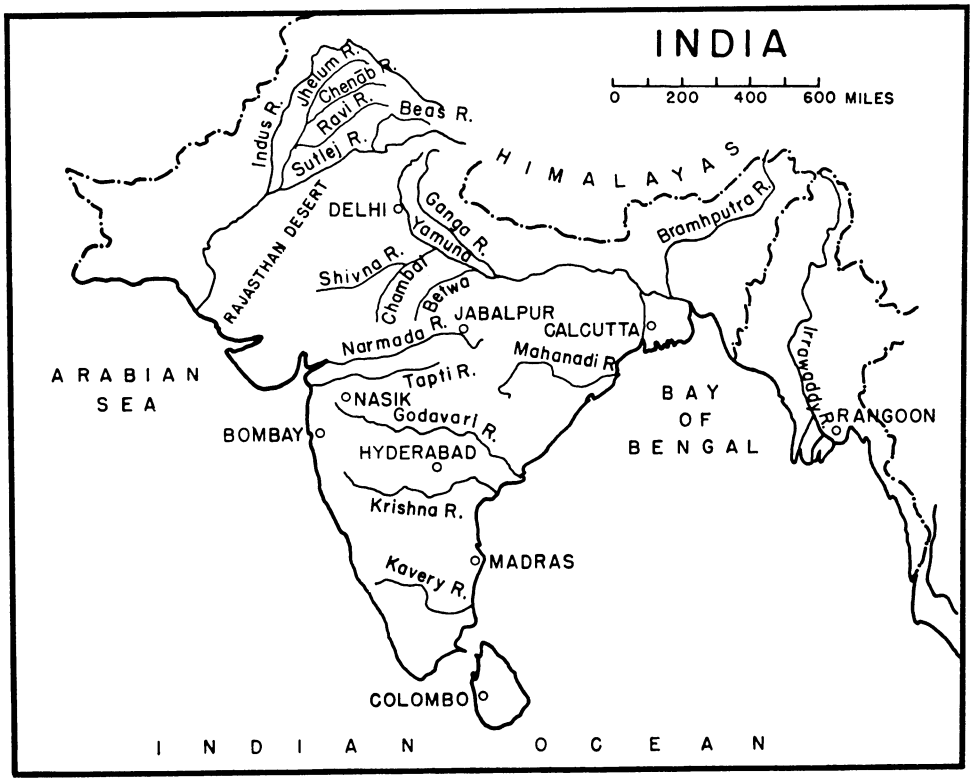


Fig. 1a Map showing the Narmada River and its central position among the peninsular rivers of India.

discoveries of several stages of the Chelles-Acheul culture established the evolution of the Early Stone Age in the valley.

The Narmada River (Fig. 1)

The Narmada or Narbada (the Namadas of Ptolemy; Nammadios of the Periplus) is one of the holy rivers of Hindustan. Flowing across the middle of the Indian subcontinent, it forms the traditional dividing line between the north and the south. Originating on the summit of the plateau of Amarkantak at about 22° 40′: 81° 45′ on the Maikala Range in the eastern Madhya Pradesh, it runs a total course of 801 mi. to join the Gulf of Cambay in the Arabian Sea near Broach in the Gujarat state. Its source in the Maikala hills has provided a name by which it is often referred in ancient scriptures, *Maikala Kanya,* or 'daughter of Maikala.' It is also known as *rewa* (Sanskrit root *ray,* 'to hop'), owing to the leaping nature of the stream down its rocky bed.

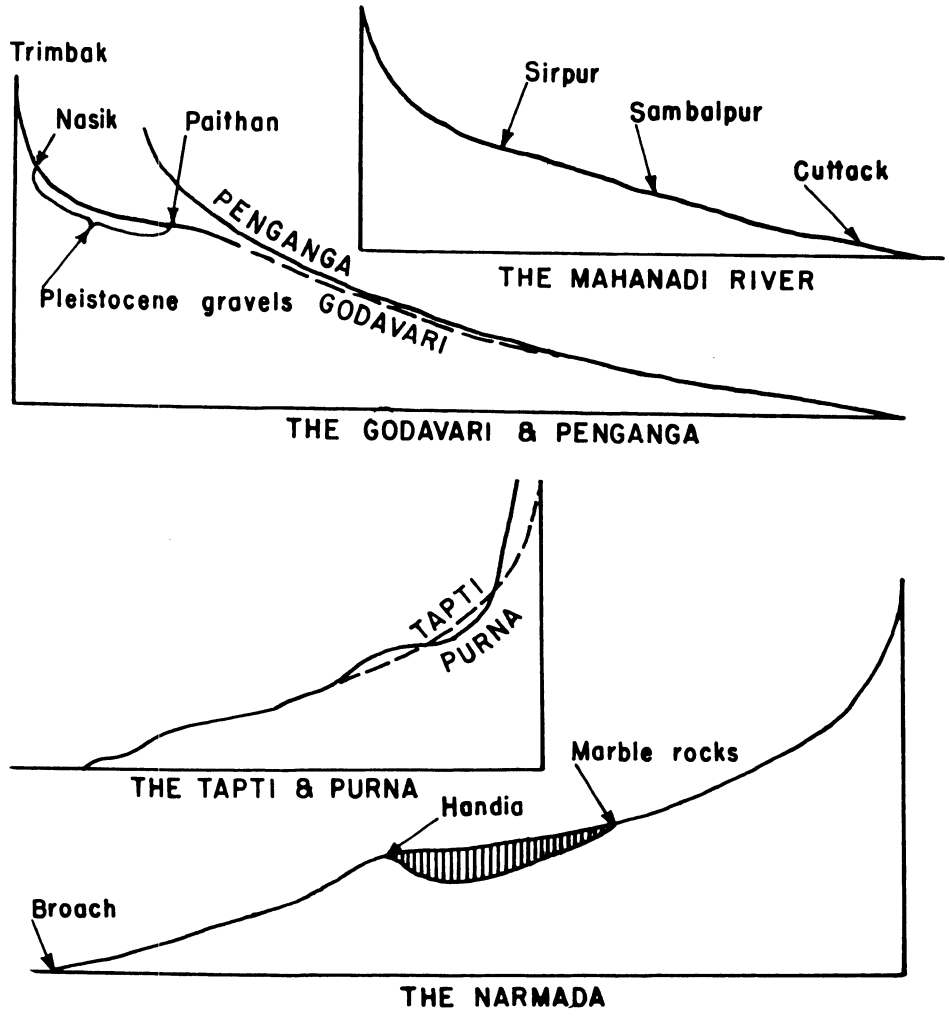


Fig. 1b River profiles of the Narmada, Godavari, Penganga, Tapti and Purna and Mahanadi Rivers of peninsular India.

Geology of the Narmada (Fig. 2)

From its source on the Amarkantak up to the Marble Rocks at Bheraghat, the Narmada flows through lava country underlain by gneissic Archean rocks. These thick sheets of lava were laid down towards the end of the Cretaceous when a vast area of peninsular India experienced a stupendous outburst of volcanic activity. The liquid lava welled out from the fissures and cracks and was deposited in horizontal bedded sheets of basalt.

At the Marble Rocks near Bheraghat, the Narmada makes a fall of nearly 40 ft. before leaping into an area of crystalline dolomitic limestone belonging to the Dharwar system. At the end of the gorge a fertile plain stretches to Handia, 200 mi. downstream, and is flanked by massive sandstone and quartzite formations of the Vindhyas and Satpuras in the north and south respectively. It is said that this extensive plain is not a valley which the river has eroded for itself, but is a two-fault plane which the stream has usurped for its channel. This alluvium-filled rift in the rocks runs parallel to the Vindhyas, and is more than 500 ft. deep, as proved by recent tube-well borings at several places. It is assumed to have originated as a result of the bending or 'sagging' of the northern rim of the peninsula sometime during the upheaval of the Himalayas. The massive sandstone escarpments of the upper Vindhyas to the north of the Narmada are of the Torridonian age. These are in contrast to the thick-bedded, massive, red and yellow sandstone of the Mahadeva and Pachmarhi hills south of Piparia, which belong to the middle Gondwana series of the Triassic epoch.

From Handia, the Narmada flows again through basalt country for some distance until it is caught up in mountainous terrain of sandstone and quartzite which continues up to Mandhata. Thence for nearly 100 mi., with an exception in the Dhar forest area where the lower Vindhyan rocks are exposed, extends another fertile plain eroded in trap rock country. On the last lap of its journey, the Narmada flows through alluvial country and forms a 17-mile-wide estuary before emptying into the Arabian Sea.

Stratigraphy of the Ancient Alluvium

The following are the main horizons which the present investigation has been able to delineate. They are depicted in a generalized section of the valley (Fig. 3).

Red Clay

The undermost stratum in the Narmada stratigraphical sequence is composed of deep red clay exposed at Hoshangabad (Kharra ghat), Bhatgaon, Ajhera, Serra Bhopali (or Serragaon) in the Hoshangabad district (Figs. 4-9) and in the Narsinghpur district at Barmhanghat (Khurd), Gararu, Murgakhera, Kharaiya, Mahadeo Piparia, and at another score of places (Fig. 10). In the Shukkar River this was seen at Gadarwara in the vicinity of the railway bridge and on the Sher at Devakachhar, Ratikarar and on the Umar at Umaria and Tindni (Fig. 11), in numerous *Khads* and ravines. The thickness of the exposed bed varies between four and twelve ft. and seems to have undergone much erosion before the next deposit was laid over it. This unconformity is most conspicuous at the above-mentioned sites.

Boulder Conglomerate (Gravel I)

Although this deposit occurs rarely in the valley, it is found well developed at Hasalpur (Fig. 12), a village about five mi. downstream from Hoshangabad, and at Kankar Ghat below the Public Works Department office in the town of Hoshangabad. At Mahadeo Piparia (Narsinghpur district), huge broken blocks of this deposit are lying near the edge of the stream.

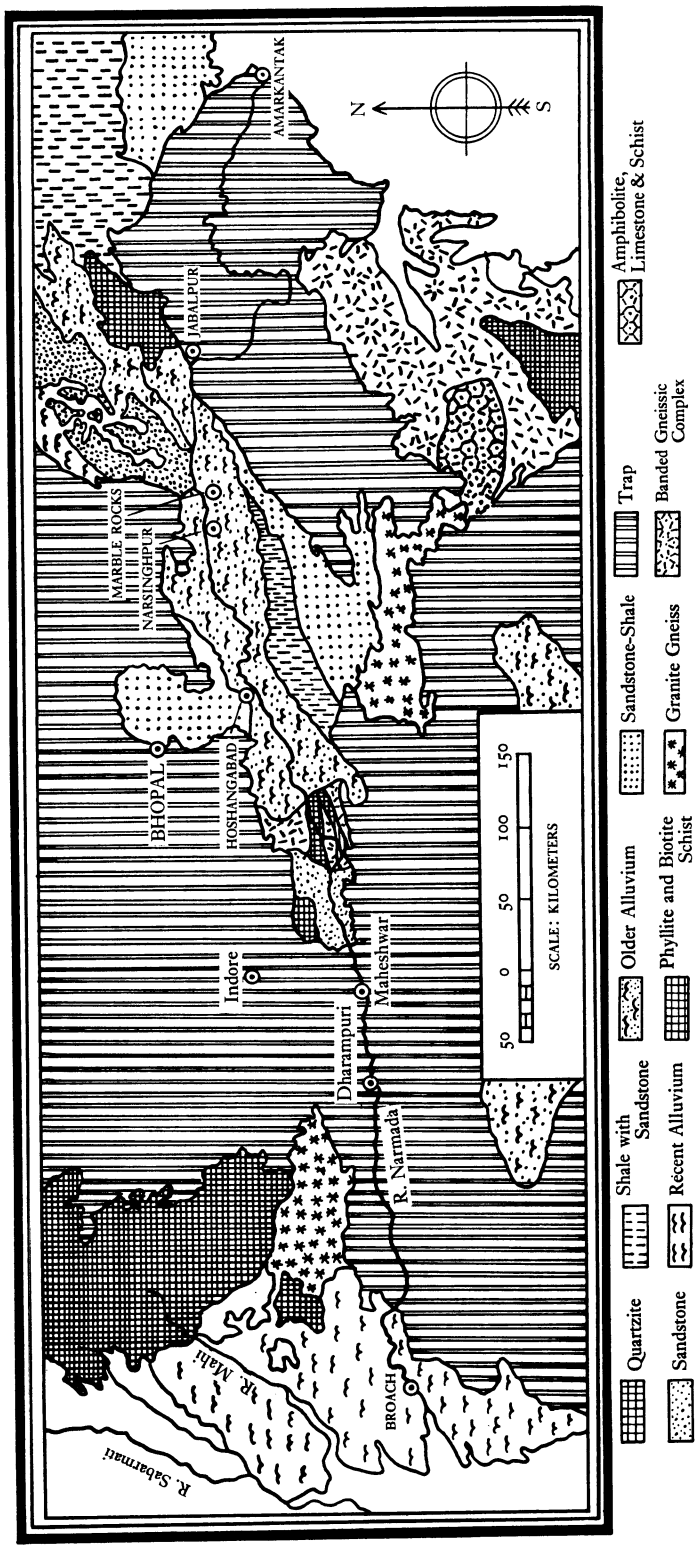


Fig. 2 Geological map of the Narmada Valley.

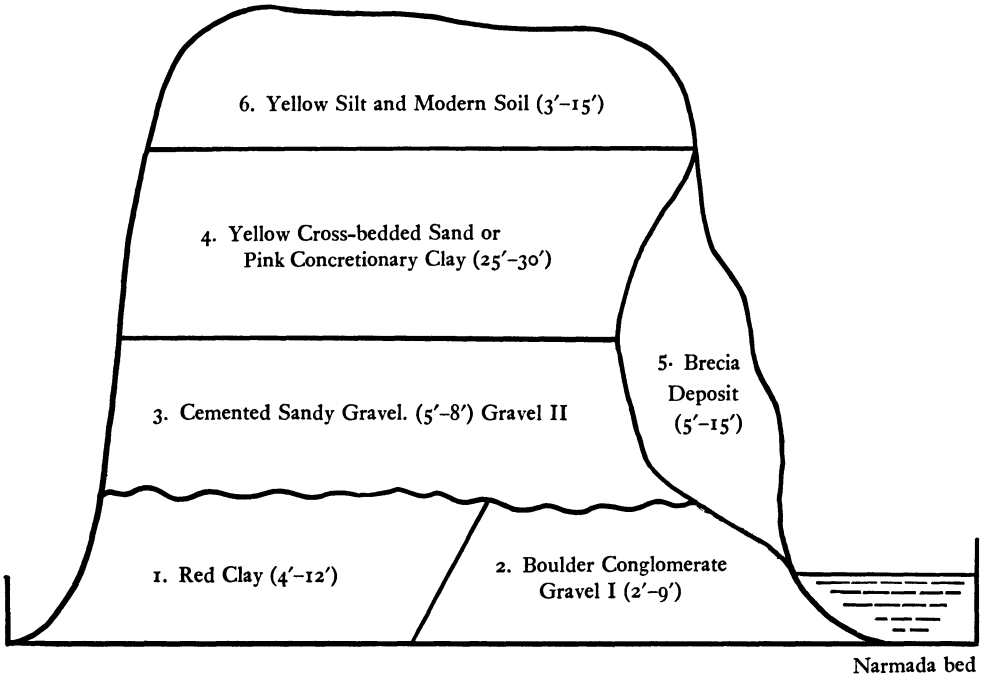


Fig. 3 Generalized section of the Narmada Valley.

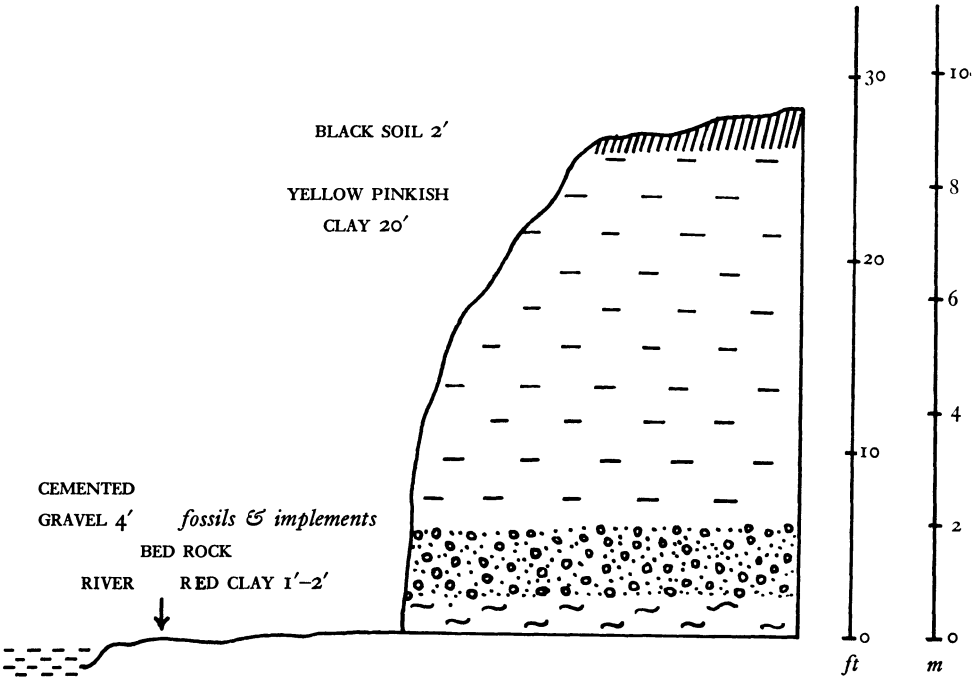


Fig. 5 Section of the right bank of the Narmada River near the railway bridge, Hoshangabad.

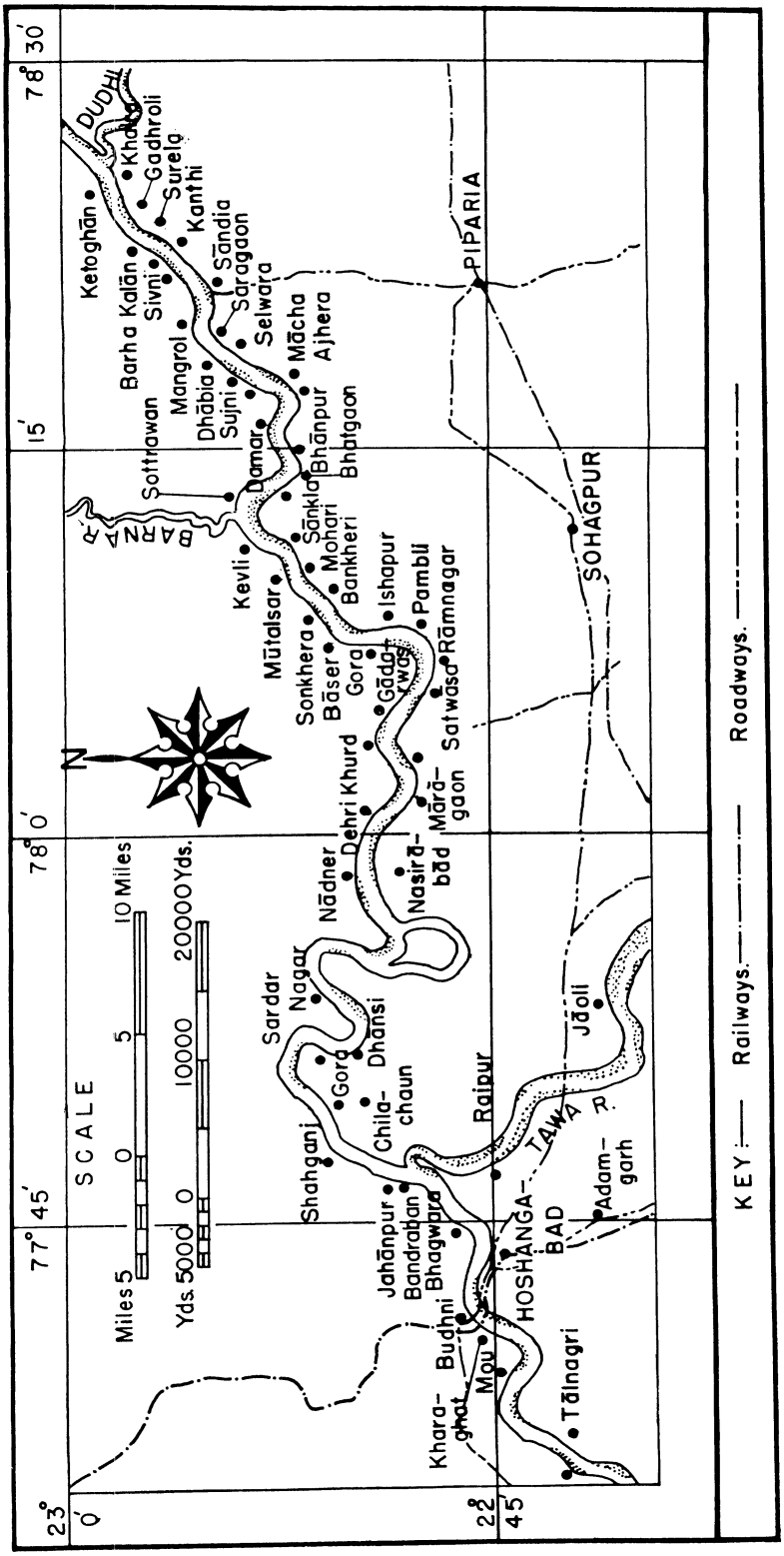


Fig. 4 The Narmada River in Hoshangabad district. The localities noted on the map were visited and were found either implementiferous or fossil-yielding or both.

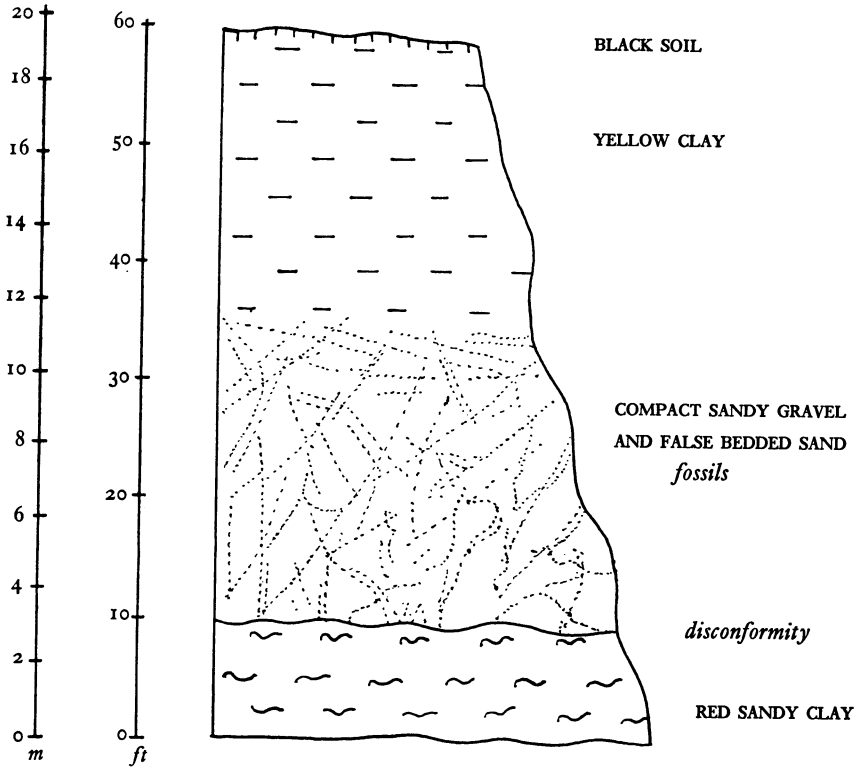


Fig. 6 Cliff section between Galchi and Bhatgaon, Hoshangabad district.

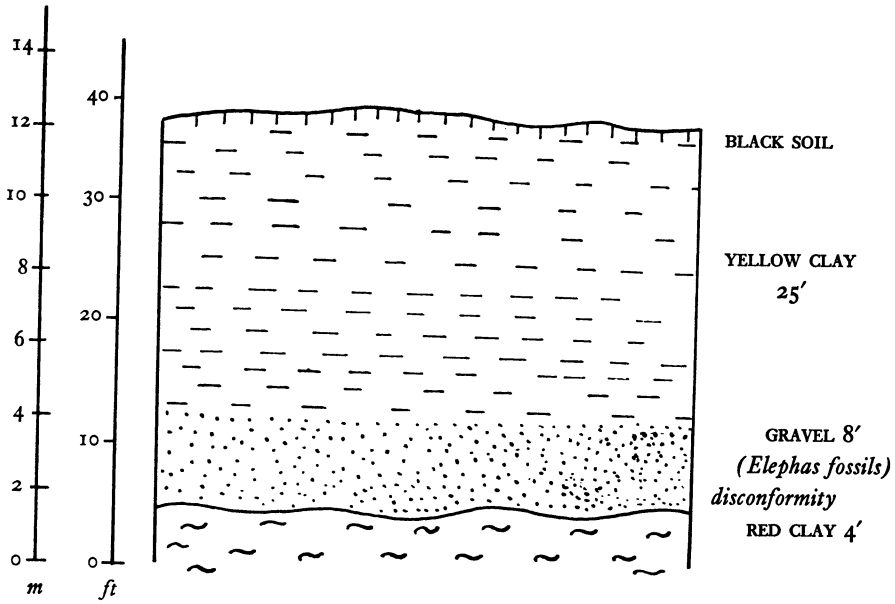


Fig. 7 Cliff section at Ajhera, Hoshangabad district.

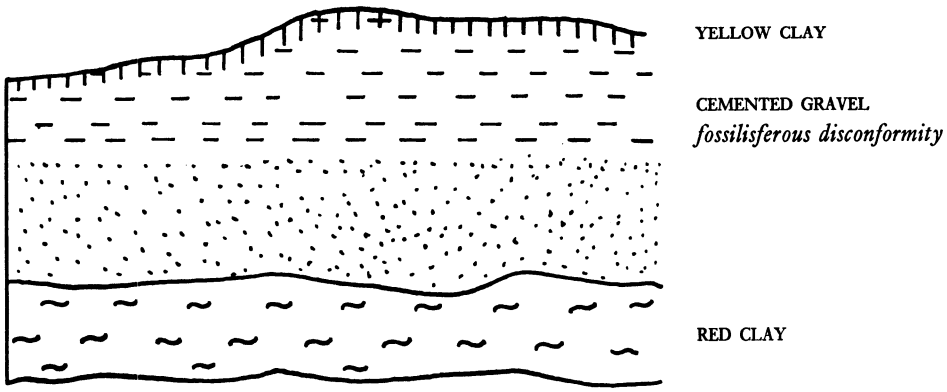


Fig. 8 Section of the right bank of the Narmada River at Sarra (Bhopali), Hoshangabad district.

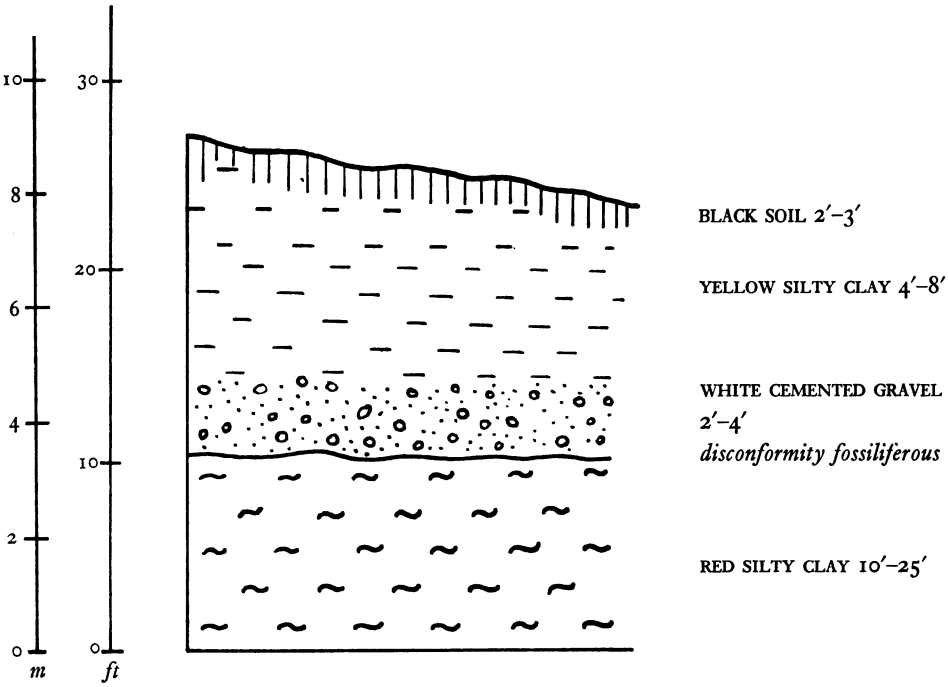


Fig. 9 Cliff section at Dhansi.

Its exact stratigraphical position is a matter of controversy. De Terra has put it below the Red Clay. The author, following Dr. M.R. Sahni, has shown it lying against the Red Clay. Further observations, however, incline the author toward the viewpoint that the deposit now called Gravel I may be nothing but the earlier facies of the deposit now called Gravel II. In any event, we can say definitely that because of the 'Mahadevian' type of tools found in it, the deposit is a near contemporary of the Red Clay in its erosional phase.

Cemented Sandy Gravel (Gravel II)—(Pls. III*b*, IV*b* and Figs. 13–14)

As alluded to above, this bed rests unevenly on the Red Clay stratum and is generally found to occur 15-20 ft. above the present water level. It is frequently encountered in the valley in the form of huge blocks eroded from their actual level by the river in flood. Sometimes the deposition is so broad that it extends for furlongs inside the banks at Sandia, 12 mi. north of Piparia (Fig. 4), and appears during the digging of wells, sometimes with fossils *in situ,* in villages nearby. Blocks of this gravel are used as building material, like laterite slabs, in the southern states of India; the author has extracted many valuable fossils from the walls of many houses so built in villages perched on either side of the Narmada.

The Gravel II stratum is richly fossiliferous, but sometimes bones exhibit their limy whiteness, revealing a state of partial petrifaction. The tools have been chiselled out of this deposit at Sagun Ghat on the Narmada, near its junction with the Sher Nadi (Figs. 4 and 10) and represent an inferior Acheulian variety. The presumption of intervening stages between these tools and those recovered from earlier deposits is confirmed by typological study of loose material gathered from the river bed. Good examples of this cemented deposit can be seen at Bhagwara (Pl. III*b*), Bandraban, Bhatgaon, Dhabla, Saragaon and Sandia in the Hoshangabad district (Fig. 4); and at Barmhan, Sagun Ghat, Pithera and other upstream locations in the Narsinghpur district (Figs. 10-11). In the Sher Valley, the localities most conspicuously exhibiting this horizon are Manoria, Devakachhar, and Ratikarar; Umaria Ghat and its surroundings on the Umar Nadi are also noteworthy.

Yellow Cross-bedded Sand (Fig. 15)

Continuing conformably over the cemented sand of Gravel II is a massively thick layer of silt and sand varying between 25 and 30 ft. It shows cross-bedding and is a product of a sluggish river, unable to carry its load farther down. This sandy deposit is the richest stratum in fossils and Late Acheulian tools of high workmanship. In addition to this stage of Chelles-Acheul culture, Nevasian or Series II appears in the upper layers of this horizon which gradually merge with modern black soil. At certain places the colour of the sand changes from yellow to pinkish, also becoming concretionary as at Hoshangabad. According to the present investigation, this deposit and the Cemented Sandy Gravel (Gravel II), are products of the late Pleistocene, as are the animal remains found fossilized in these strata.

Breccial Deposit (Gravel III)—(Pl. I*b* and Fig. 16)

This deposit is extensively exposed at several places in ancient hollows of the denuded banks. It contains bones which are minimally fossilized and show remains of recent fauna. The localities noteworthy for this deposit are Bhatgaon and Ajhera in the Hoshangabad district (Fig. 4), where three complete, semi-fossilized *Elephas* skulls of the present living species, *Elephas indicus,* were found. The same phenomenon is repeated at Barmhanghat, near the bus stand adjacent to the temple, farther upstream (Pl. III*b,* Fig. 13). In addition to recent fauna was found the rolled material of Nevasian or Series II tools (Middle Stone Age)

Plate I a. River Narmada at Barmhan ghat, Narsinghpur district. M.P. The opposite bank is of yellow brownish silt and sometimes yields bones of animals of present times though fossilized to some extent.

Plate II a. River Sher at Devakachhar, Narsinghpur district. M. P. The horse-shoe meander above is one of the richest fossil-yielding sites in the Narmada Valley.

Plate I b. Gravel III exposed on the left bank of the Narmada at Barmhan ghat, Narsinghpur district. M.P. Middle stone age tools and rolled quartzite palaeoliths were found *in situ* in the deposit.

Plate II b. A fossiliferous deposit on the left bank of the Narmada near Bandraban, five miles upstream from Hoshangabad town, M.P. Advanced acheulian handaxes and cleavers were also recovered along with fossils.

Plate III a. Bhagwara gravel on the right bank of the Narmada at Hoshangabad. Richly implementiferous. Fossils also found.

b. Gravel II on the right bank of the Narmada at Bhagwara, Hoshangabad. M.P.

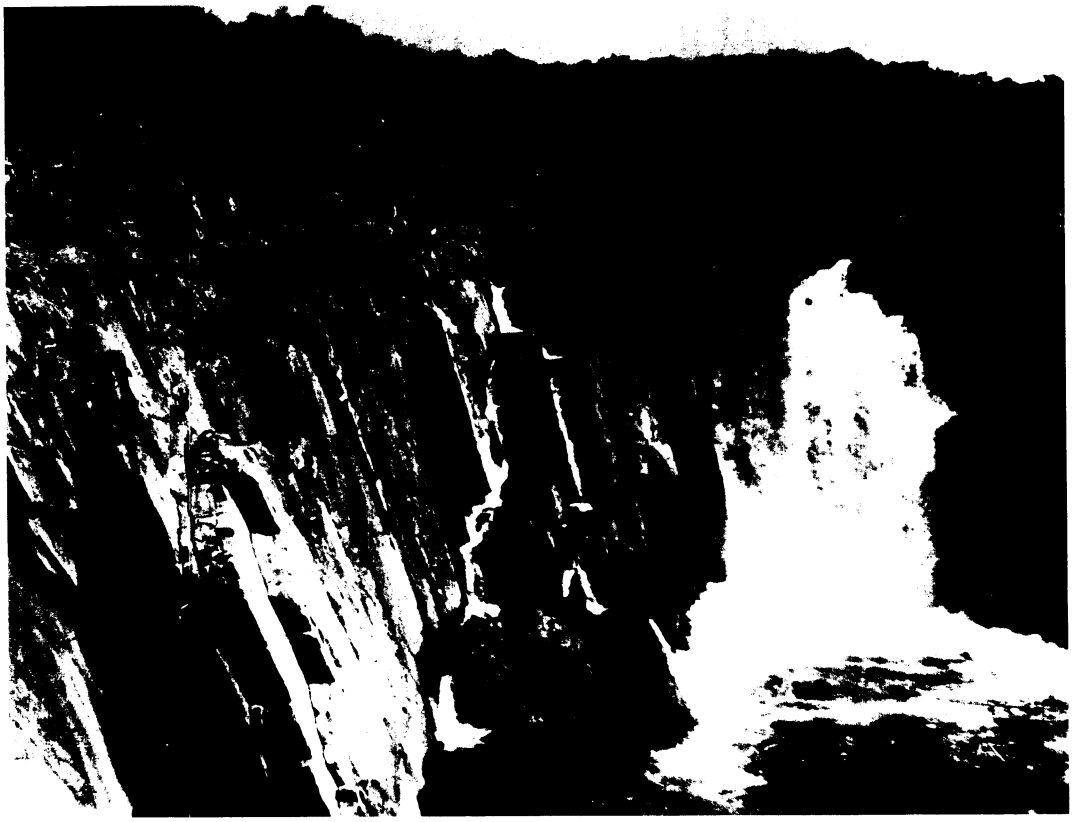
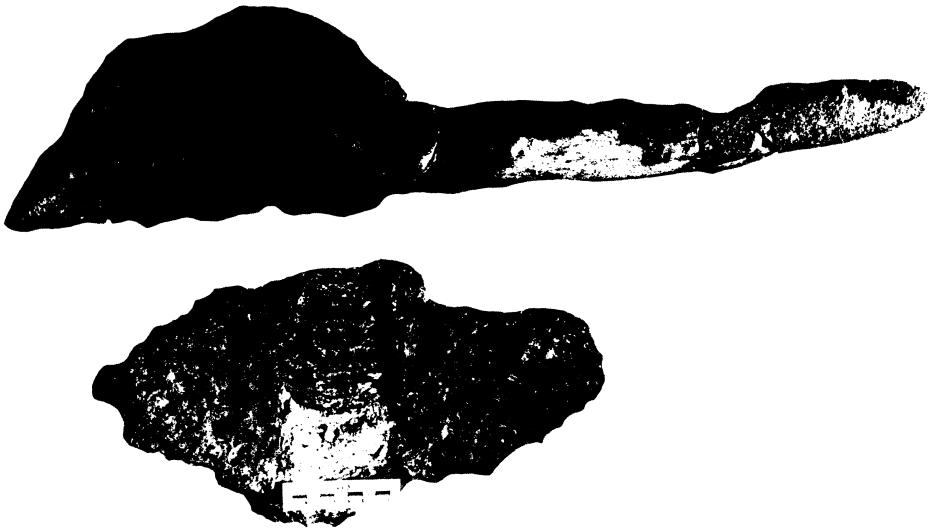


Plate IV a. Dhuandhar fall of the Narmada at Bheraghat. Near this place one can see the ancient course of the river.

IV b. Fossiliferous deposit at Sagunghat, on the Narmada in Narsinghpur district. Gravel II is exposed extensively.

Plate V a. Skull of *Elephas indicus* found *in situ* at Ajhera, on the left bank of the Narmada. Hoshangabad district.



b. Tusk and molars of the same individual.

and rolled hand axes, flakes and cleavers of earlier periods showing the redeposition of earlier displaced material. The breccial deposit is of some antiquity; it is indicated to be earlier than modern soil by the presence of bones that have fossilized, however minimally. But let it be remembered that this does not form a part of the third cycle of deposition as indicated by De Terra. It is encountered only infrequently.

Yellow Silt and Modern Soil

The yellow cross-bedded sand gradually ends up in silt capped by a small layer of humus or black soil. No fossils but Series II tools and microliths are found on the surface.

The occurrence of laterite in the Narmada Valley has a significant bearing on the stratigraphy of the ancient alluvium. R.D. Oldham (1893) mentioned that the laterite in the Narmada Valley occurs below the Boulder Conglomerate (Gravel I) level. On Oldham's authority, De Terra suggested that since the Boulder Conglomerate is of the Middle Pleistocene, as indicated by the fauna it contained, and because the laterite is lying immediately below it, the laterite dates from pre-Middle Pleistocene or Lower Pleistocene. The present investigation does not support this. The laterite has not been noticed lying immediately underneath the Boulder Conglomerate. Moreover, the investigation at Adamgarh hillock and at Chidgaon (Fig. 17) shows that the lateritization process might have taken place in the Upper Pleistocene at a time when early man in the Narmada Valley was manufacturing tools of the Early Acheulian type. The sections showing the best stratigraphical position of the laterite were seen in a gully near Chidgaon, a village on the Hoshangabad—Harda bus line, and at Tugaria, near Adamgarh hillock, about one and a half mi. south of the town of Hoshangabad. The Early Acheulian tools *in situ* were found at Adamgarh hillock in the slopes where the laterite has been deposited in pockets.

Fossiliferous Horizons

Mammalian fauna has been collected *in situ* from four horizons: the Boulder Conglomerate (Gravel I), the Cemented Sandy Gravel (Gravel II), the yellow or pinkish Cross-bedded Sand, and the Breccia and gravel (Gravel III) deposited in the hollows of the banks made of earlier deposits. Earlier investigators, particularly William Theobald (1860: 291), mentioned having extracted a big *Elephas* tusk, similar to one discovered at Hoshangabad by this writer, from the Red Clay horizon of the Narmada at Bilthari, 12 mi. from Barmhanghat downstream on the Narmada in Narsinghpur district. But the Hoshangabad tusk came from the base of the yellowish or pinkish clay which, at Kharra Ghat, the site of discovery, rests on the Vindhyan quartzite. It seems that the early forms of Pleistocene fauna persisted until the beginning of the Holocene and then perished under the stress of climatic and human onslaught. It is not without significance that the teak forests of the Narmada still teem with wild life, including some ancient species, particularly those of the *Cervus* family, whose fossils have also been found in the Shiwalik foothills of the Himalayas. Elephants were a common sight in the jungles of central India as recently as the 16th century; it is recorded history that Akbar, the great Moghul emperor, used to hunt them enroute to Deccan on journeys to conquer or to chastise. The great Indian bison still roams the jungles of central India, though now restricted to the limited area of Chindwara and neighbouring tracts, and is also represented in the fossil record of the Narmada beds.

The fossils from four horizons also illustrate the various degrees of fossilization. Boulder Conglomerate fossils are thoroughly fossilized and are dated Middle Pleistocene by previous

investigators. In the current investigations, only the Hoshangabad conglomerate yielded fossils, although very few. What it contained were fragments of long bones, except for one or two complete specimens, one a bovid horn. Among surface finds, however, there are specimens with 100 per cent fossilization, such as the bovid skull from Sohagpur Tehsil, Hoshangabad (Pl. VII*a*), which might belong to that phase. The Cemented Sandy Gravel (Gravel II) fossil material is very difficult to extract because of the hard matrix in which it is imbedded. Fossils are plentiful, but the fossilization is imperfect. The white calcium of embedded bones shines when they accidentally break during the extraction process.

The richest source of mammalian fossils in the Narmada is the Yellow Cross-bedded Sand, which also yields Late Acheulian and Nevasian tools. The area encompassed by the Narmada, the Sher and the Umar near Devakachhar, is the next best collecting-ground for Pleistocene fossils in the whole of India outside the Shiwalik zone. Complete skulls, ramii, molars, long bones of *Elephas namadicus, Hippopotamus, Bos* and *Equus* have been recovered from this locality, *in situ* and in the loose sand of the present bed. Fossilization of fauna is also remarkably complete in this bed. The specimens are generally stained red or yellow because of iron in the sand, particularly at Barurewa, Sher and the Umar, all in Narsinghpur district.

The deposits formed in the hollows of the river banks (Gravel III) also show fossilization. These bones generally belong to present-day fauna. In one such deposit, occurring at Bhatgaon and Ajhera, Hoshangabad district (Fig. 4), the writer recovered three large skulls of *Elephas indicus* (Pl. V, *a-b*), the present-day species of Indian elephant, and many other bones of large animals.

Fossils from the Fields

The fields along the bank of Barurewa Nadi, a tributary of the Sher, yield an extraordinary wealth of bones mixed with kankar and show slight fossilization. They are found on the surface. These fields are only a few miles away from the village of Devakachhar and can be visited with the help of the local guide. These slightly fossilized bones belong to present-day fauna and represent the youngest stage among the Narmada fossils. Gravel III fossils and those found in the fields belong to the same category.

Fossil Fauna

From a collection of more than a thousand fossils, the species which can be assuredly identified are as follows:

A. Probascidae

1. *Elephas namadicus* (antiquus): Tusks, molars, mandibles, ramii, anterior and posterior ends of long bones
2. *Elephas indicus:* Skulls with teeth and tusks intact (Pl. V, *a-b*)

B. Hippopotamoidae

Hexaprotodon namadicus: Skulls, molars and canines

C. Bovoidae

1. *Bos namadicus* (Pls. VI *a*; VII *a*; VIII *a-b*)
2. *Bubalus palaeindicus:* Skulls, maxillary fragments, ramii, upper and lower dentition, parts of long bones, etc.

Plate VI a. Fossilized bovine ramii collected from the bed of River Sher at Devakachhar, Narsinghpur district, M.P.

Plate VI b. Fossil specimens of the 'ends' of long bones of extinct mammals. Devakachhar, R. Sher, Narsinghpur district, M.P.

Plate VII a. Bovine skull, collected from the district.
A beautifulspecimen Narmada bed in Sohaghur Tehsil, Hoshangabad which iscompletely fossilized.

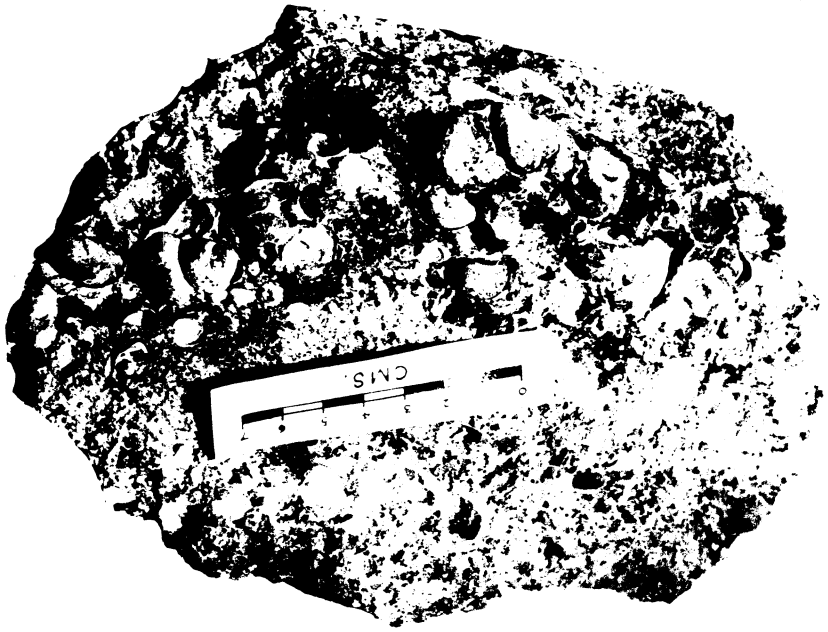


Plate VII b. A block of gravel II showing fossilized gastropods and clams.
Loc: Devakachhar, River Sher, Narsinghpur district. Madhya Pradesh.

Plate VIII. a. A fossilized skull of *Bubalus palaeindicus* found on the right bank of the Umar Nadi at Umarghat near Devakachhar. Narsinghpur district (M.P.)

Plate VIII. b. A lateral view of the above.

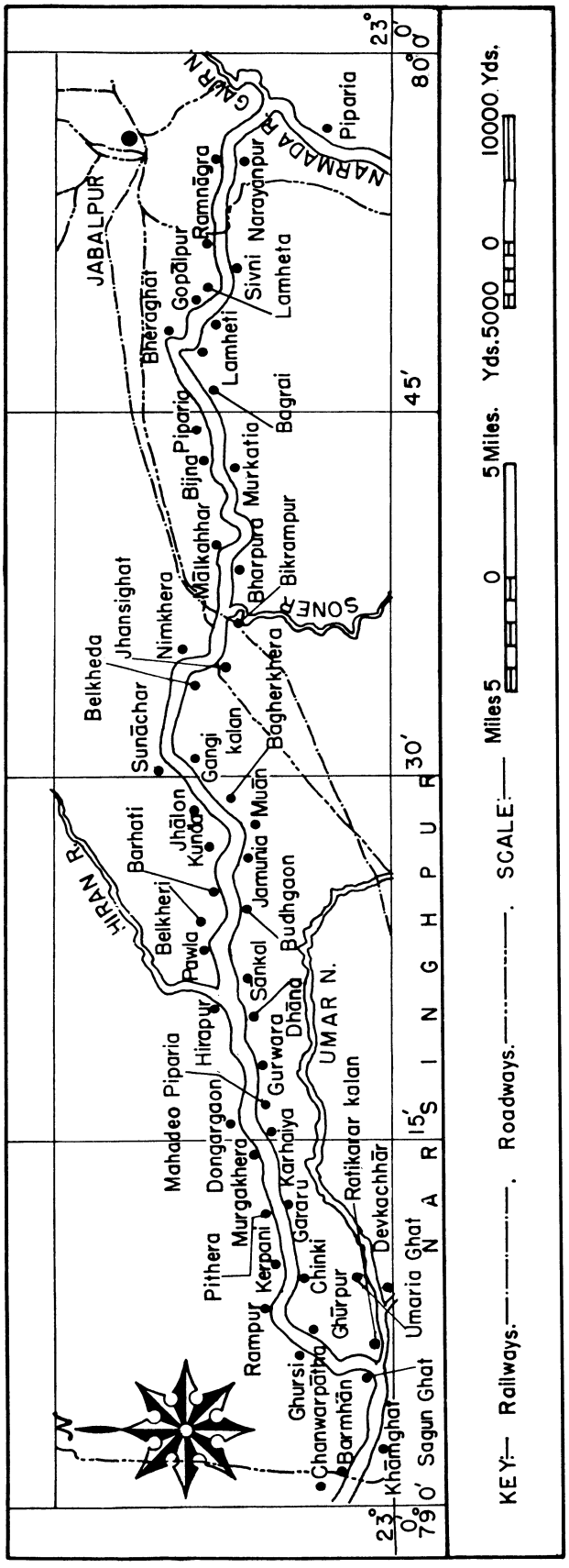


Fig. 10 The Narmada from Barmhan to Jabalpur with important fossil or tool-yielding localities, Narsinghpur and Jabalpur districts, Madhya Pradesh.

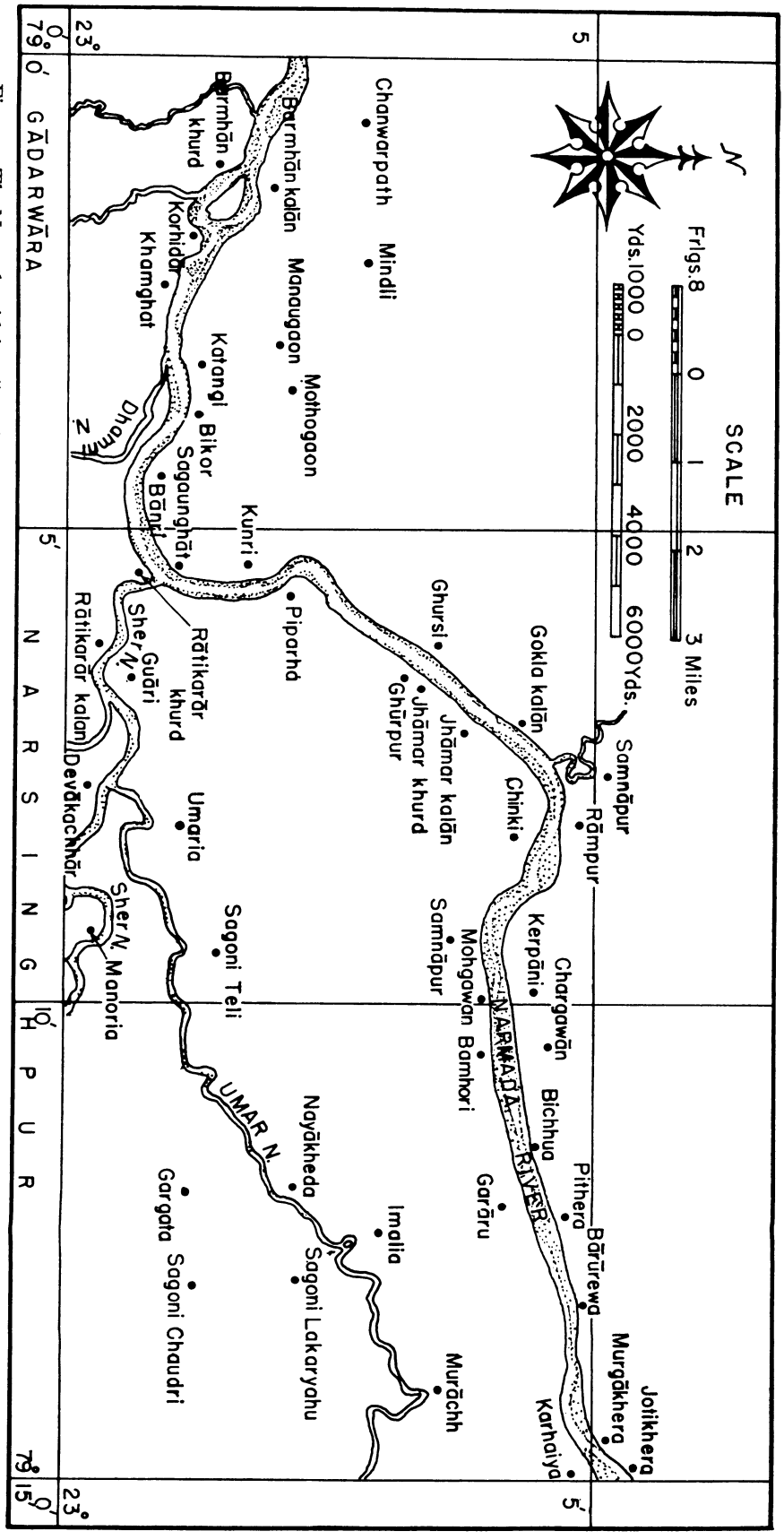


Fig. 11 The Narmada with its tributaries, the Umar and Sher Rivers, with implementiferous and fossiliferous sites, Narsinghpur district, Madhya Pradesh.

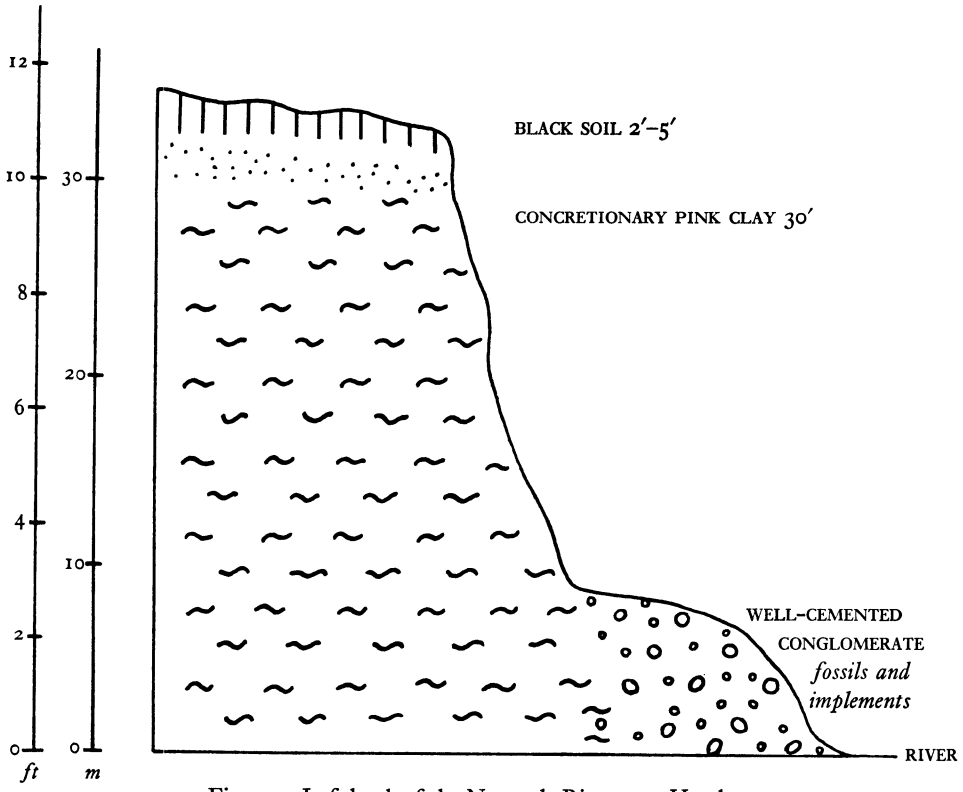


Fig. 12 Left bank of the Narmada River near Hasalpur.

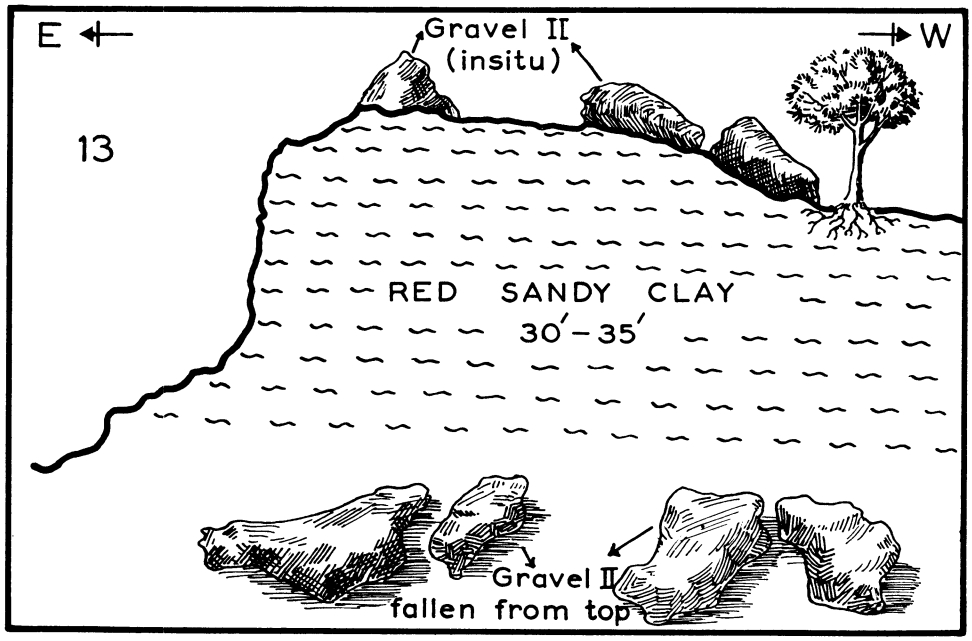


Fig. 13 Section of the sourthern bank of the Narmada River at Barmhan Ghat, Narsinghpur district.

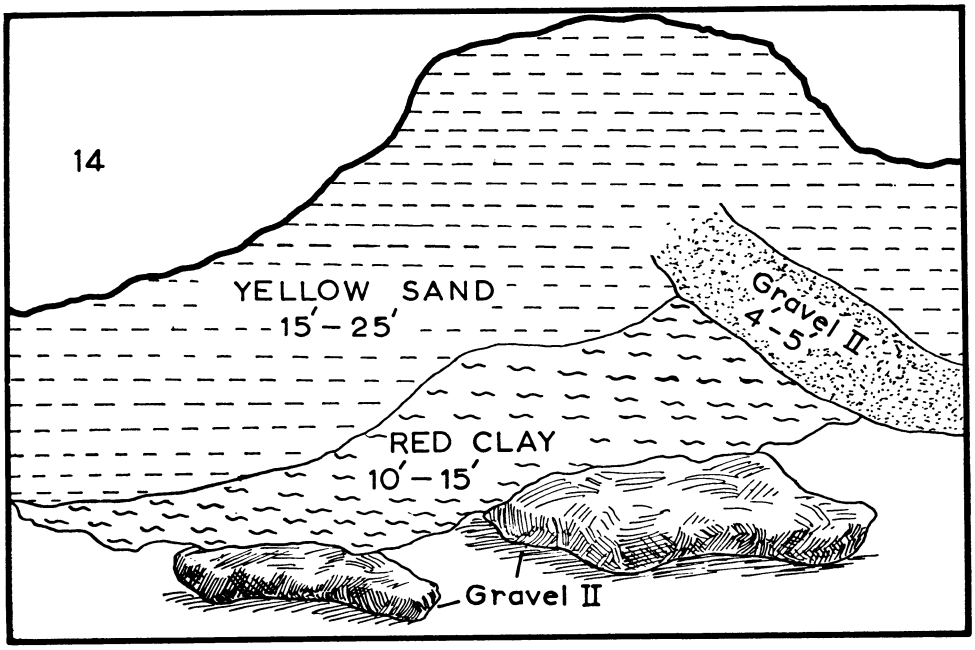


Fig. 14 Section at Bela Ghat on the Sher River, a mile and one-half upstream from Devakachhar, Narsinghpur district.

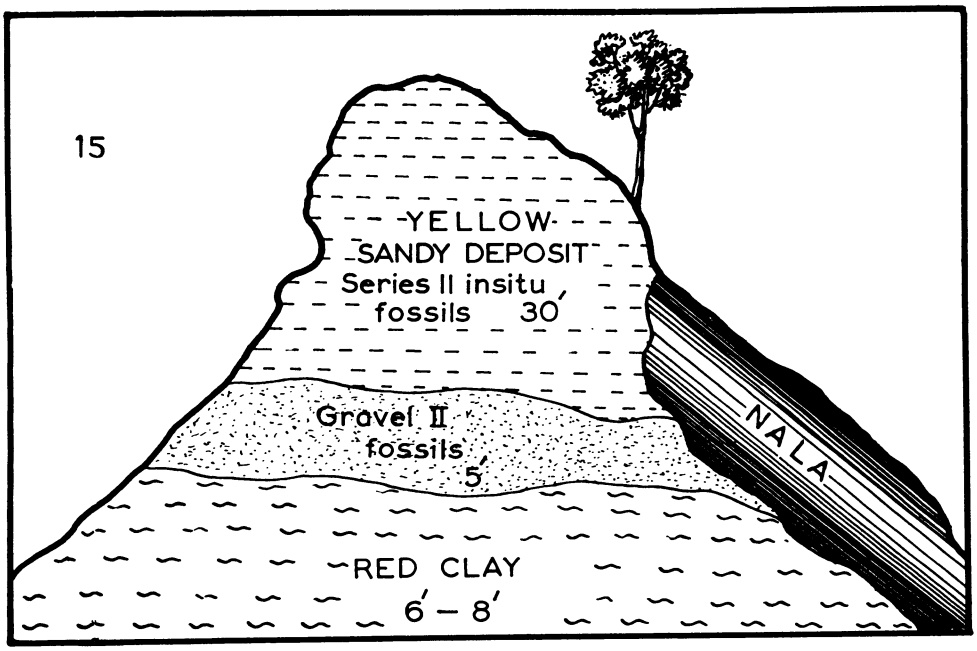


Fig. 15 Section near Umaria Ghat on the Umar River, near Devakachhar, Narsinghpur district.

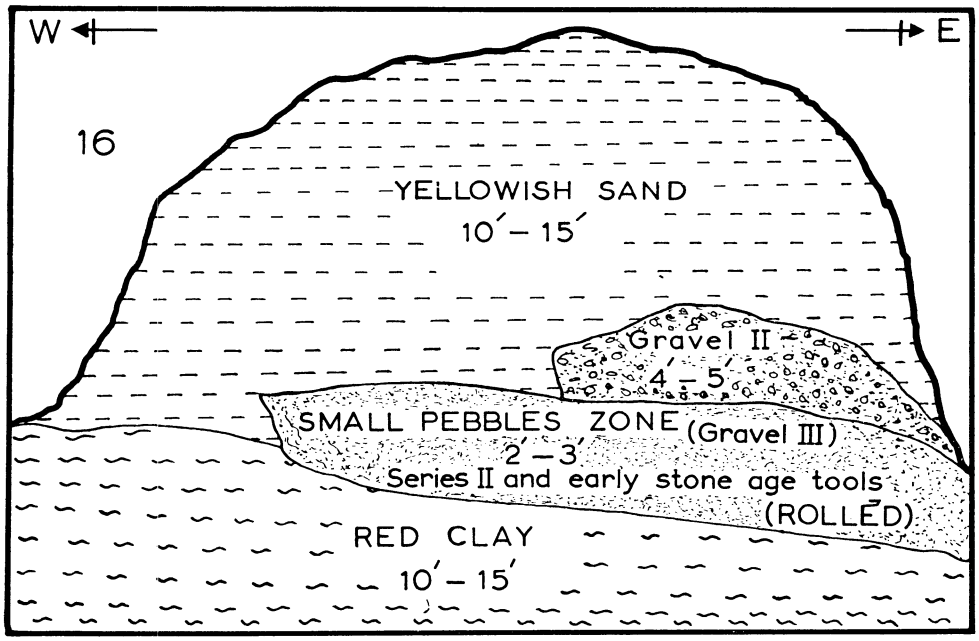


Fig. 16 Section of the southern bank of the Narmada River at Barmhan Ghat, Narsinghpur district.

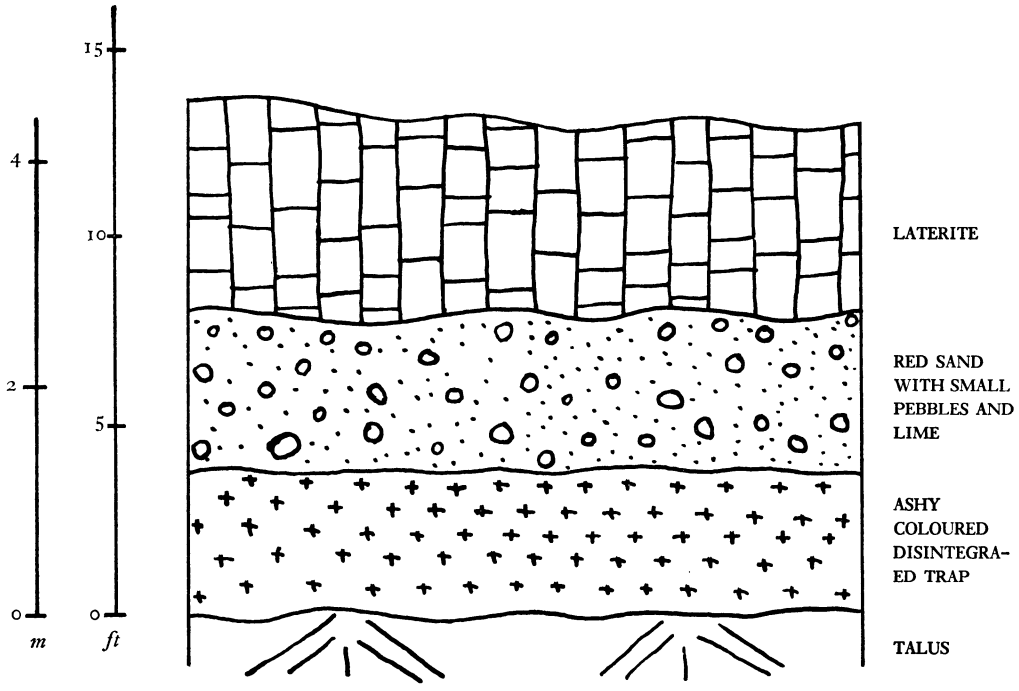


Fig. 17 Section exposed in a gully near Chidgaon.

D. Equidae
Equus namadicus: Ramii, dentition, fragments of long bones

E. Suidae
Sus species: molars

F. Cervoidae
Cervus species: horn

No remains of the rhinoceros, *Ursus, Leptobos* or Stegodon listed by Pilgrim (1905) from the Geological Survey of India collection have been found. The confusion probably arises from the incorrect placement of *Leptobos* and Stegodon, which characterize the Pinjor fauna of the Shiwalik series, under the Narmada label. Moreover, Dr. Teilhard de Chardin of the Yale-Cambridge expedition, who critically examined the collection in Calcutta, reported that the skull claimed to be of the *Leptobos* may very well be a damaged *Bos* skull. He further noted that the fragments of tusks assigned to Stegodon are so fragmentary and imperfect that not even a generic identification is possible, much less a specific identification (De Terra and Paterson 1939: 318).

Among the invertebrate fossils which occur in large numbers, the following can be mentioned with certainty: (1) Gastropoda: *Melania, Pludina, Bithynia;* Lamellibranchia: *Unio marginalis, Unio Vorrugatus.*

Fossilized Ivory Tusk of Elephas Antiquus (Namadicus).

This is a rare and important find made by the present writer in the Narmada Valley. The tusk measures 2.14 m in length along the outer curve and is 51 cm in maximum circumference near the root end. The tip end, which should have been at about 70-75 cm, was not found intact. It was probably swept away in the flood. The break was not found to be recent, as proved by a study of a section of the anterior end. At its root end pebbles adhere to the tusk; a cement of sand and lime preserves the original break from the cranium. It appears on reconstruction that the tusk would have extended a few centimeters more on the root end side. At the time of the elephant's fatal accident, the total length of this tusk should have been approximately 3 m, taking into account its missing portions.

The writer found the tusk *in situ* on 12 December 1960, at the base of the yellow-brownish sandy clay belonging to the upper group of the Narmada alluvial stratigraphy at a place called Kharraghat, near the Hoshangabad railway bridge. The spot of discovery is about a furlong downstream from the bridge, along the northern bank which is 4 to 6 m high at this place. The discovery location was at that time about 3 m above the water level and 5.6 m from the water's edge. Before this find, three instances of such a discovery had been recorded; all of them are compared with the present find in the table below. It is clear from the measurements that the present tusk belongs to *Elephas namadicus* (a variety of *Elephas antiquus),* like the earlier three discoveries. Moreover the writer saw a very similar tusk in the fossil gallery of the Musée National d'Histoire Naturelle, Paris. It was recovered in 1895 by a railway engineer, M. Le Blane, from the quaternary alluvium at Tilloux near Gensac-la-Pallue (Charante). That tusk also measures 3 m in length and was found in association with a man-made stone implement. The resemblance between the French specimen and the present find impresses one that their owners must have belonged to the same species, though separated by thousands of miles of land and sea barriers.

In the 1850s, Major General Tremlow (Pilgrim 1905: 200) was the first to discover such a tusk, at Paithan, south of Aurangabad on the Godavari River. After being taken to London, however, the tusk disappeared. It was believed to have a maximum circumference of 72.5 cm.

In 1859, William Theobald, of the Geological Survey of India, made a second discovery, this time from the Narmada at Bilthari, 12 mi. from Barmhanghat downstream on the Narmada in the Narsinghpur district (Theobald 1860: 291). According to Theobald, the tusk was found embedded in the Red Clay. It is now kept in the Indian Museum at Calcutta. Its length along the outer curve is 2.31 m and it has a maximum circumference of 63.5 cm. Theobald notes that a few years before his arrival, a similar tusk was known to have been found at that very place and taken to Saugar. It probably belonged to the same individual as his. It was believed to be over 3.5 m long.

In 1904, G.E. Pilgrim made the third discovery of this coveted object in the alluvial deposit of the Godavari at Nandur. He excavated a complete skull of *Elephas namadicus* with a portion of the tusk having a maximum circumference of 62.5 cm. He published an excellent paper describing the find and its implications, with comments on the age and distribution of the species (Pilgrim 1905).

The present discovery of the *Elephas antiquus (namadicus)* tusk is the second discovery of its kind from the Narmada and the fourth discovery, including the two Godavari finds, during the last 100 years. This fact itself speaks for the rarity and invaluability of the grand tusk. Its value is further enhanced by its perfect preservation and the proper recording of the stratigraphical horizon of its embedment. Data recently collected from the valley help determine the age of the tusk. The present investigation places the yellow sandy clay in the Upper Pleistocene. The clay is richly fossiliferous, at many places yielding Late Acheulian tools along with fossilized mammals. Accordingly, this ivory tusk may also date back to the Upper Pleistocene.

COMPARISON OF THE *ELEPHAS ANTIQUUS (NAMADICUS)* TUSKS RECOVERED FROM THE NARMADA AND GODAVARI RIVERS

LOCALITY:	HOSHANGABAD	BILTHARI	NANDUR	PAITHAN
RIVER:	NARMADA	NARMADA	GODAVARI	GODAVARI
DISCOVERER:	A. P. KHATRI	W. THEOBALD	G. PILGRIM	MAJOR GENERAL TREMLOW
YEAR:	1960	1859	1904	(1850s)
1. Actual length of tusk or portion obtained	2.14 m (7.05 ft.)	2.31 (7.7 ft.)	—	—
2. Probable total length of tusk	3.00 m (9.10 ft.)	3.66 (12 ft.)	—	—
3. Maximum circumference	51 cm (20.7 in.)	63.50 (25 in.)	63.50 (25 in.)	72.5 (29.0 in.)
4. Minimum circumference	40 cm (15.7 in.)	45.72 (18 in.)	20.32 (8.0 in.)	—
5. Maximum diameter	20 cm (7.87 in.)	—	—	—
6. Minimum diameter	14 cm (5.51 in.)	—	—	—

Summary and Conclusion

The area between Bhera Ghat and Handia is a rock basin 200 mi. long and nearly 500 ft. deep, which the Narmada filled with its deposits in Pleistocene times. Six strata are distinguished in this alluvium; four of them are fossiliferous. Nearly seventy such sites—either fossiferous or implementiferous or both—were discovered.

In the Narmada collection of fossils is represented *Elephas namadicus, Bos namadicus, Equus namadicus, Hippopotamus, Bison, Bubalus, Sus* and *Cervus*. These fossils range in time from Middle Pleistocene to Holocene. The degree of fossilization varies from horizon to horizon. The earliest—but not all—of the mammalian fossils can be compared with those from the Boulder Conglomerate Zone of the Shiwalik foothills of the Himalayas. The Narmada Valley is unique in all of India in the coexistence of fossil fauna with different stages of Chelles-Acheul culture.*

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