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A PRELIMINARY STUDY ON THE STONE AGE ARTEFACTS OF NETANKHERI, SEHORE DISTRICT, OF CENTRAL NARMADA VALLEY IN MADHYA PRADESH

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Abstract: *The Narmada basin has very special significance in Indian Quaternary studies. It is one of the important regions in India where Pleistocene deposits occur in association with the Stone Age artifacts of all prehistoric periods and contemporary animal and plant fossils. Thus for the Quaternary stratigraphy and chronology of India, the Narmada basin is the key area of study. It is also because of this consideration that this basin holds a great potential for the find of the earliest tool making Hominid groups in India. The valley is famous for the discovery of hominid fossil 'Narmada Man'. The present study has been done in Netankheri village of Sehore district of Madhya Pradesh. This district is situated in central Narmada Valley. The Study has been concentrated in cultural remains of the prehistoric past and the paleo environment of that area as reconstructed from naturally exposed undisturbed stratigraphy. Therefore, the present study is a preliminary approach to study the cultural evolution of the prehistoric past in Netankheri locality of central Narmada valley.*

INTRODUCTION

Investigation into the Indian Paleolithic culture commenced over a century ago with the discovery of the first Paleolithic tool at Pallavaram near Madras by Robert Bruce Foote in 1863. However, the real impetus to the scientific study of the prehistoric culture was given in the thirties of the 19th century by the Yale – Cambridge team of geologists and archaeologists under the leadership of H. de. Terra and T.T. Paterson. They worked in the Kashmir Valley and Potwar Plateau and briefly examined the Narmada valley near Hosangabad and the Kortalayar River near Madras and by their study tried to integrate the prehistoric cultures with their contemporary environment. It is important to mention that the Indian subcontinent contains one of the richest and continuous records of hominin behavior in the Old World. According to Chauhan, this evidence is found in diverse paleo ecological settings and temporal contexts (particularly in India), reflecting the successful adaptive strategies of South Asian hominins during the Pleistocene. More importantly,

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this evidence geographically links similar records of behavior from both the western and eastern parts of the Old World (Chauhan, 2006).

The study at Narmada Basin is important because of its geographical location, which is strategic for migration of animal population from North to South and East to West. It is not only rich in fossils and archaeological sites, but also has a long history of human occupation, and this region is facing submergence due to dam construction. This basin has a very special significance in Indian Quaternary studies. It is perhaps one of the few regions in India, besides the Siwaliks, where Pleistocene deposits occur in association with the Stone Age artifacts of all periods and contemporary animal fossils. Thus for the Quaternary stratigraphy and chronology of India, the Narmada basin is the key area. It is also because of this consideration that this basin holds a great potential for the find of the earliest tool making Hominid groups in India. In view of the wealth of the Pleistocene mammalian fossils and Pleistocene stone tools of different periods, the region has received attention of the archaeologist, geologist, prehistorians and anthropologists alike. The occurrences of sites of Mesolithic, Neolithic, Chalcolithic and historical periods, besides those of the Paleolithic sites show that this region provides suitable environment throughout the Quaternary period. The discovery of fossilized human cranium of the 'Narmada Man' (*Homo erectus narmadensis* or 'archaic' *Homo sapiens*) from boulder-conglomerate deposits of Quaternary period in Narmada valley at Hathnora, Madhya Pradesh by Sonakia (Sonakia, 1984) was a major breakthrough in the field of Indian paleoanthropology. It is a remarkable finding not only for India but also for the entire South-East Asian paleoanthropology. From this path- breaking discovery, paleoanthropologists gained the first scientifically authenticated fossil hominid specimen from the Late-Middle Pleistocene of the Indian subcontinent. This discovery is very important since this is the only instance in India, where we have the skeletal remains of Paleolithic man though his tools are available from numerous sites (Sankalia, 1974).

REVIEW OF THE LITERATURE

The earliest account of the Narmada valley was given by Prinsep (1833) and Spilsbury (1837) who made rich collections of the mammalian bones from the alluvial beds of the central Narmada. After that Theobald, (1860) geologically divided alluvial beds into the lower and upper groups. During the next 50 years various aspects of Pleistocene archaeology of the Narmada valley were studied by various scholars such as Medlicott (1860), Binford (1869), Oldham (1871, 1893), Pilgrim (1905). One important event in this period was the discovery of a stone tool made of Vindhyan quartzite in the reddish yellow

clay at Bhutra (Medlicott, 1873) and with the help of this discovery, archaeologists dated the Narmada beds to the early Pleistocene. Pilgrim (1905) supports this date with the help of his paleontological studies of the Godavari and Narmada deposits. The first systematic geological and archaeological investigation at Narmada Basin between Hosangabad and Narsinghapur that was done by de. Terra and Patterson (1939) established four terraces on one of the tributaries of the Narmada near Narsimhapur. They failed to correlate them with the three main sedimentary cycles, which they observed in the main channel of the Narmada River. The most important claims made by de. Terra and Patterson were that the older alluvium was not older than the middle Pleistocene and there was no faunal and cultural change between the lower and upper group of older alluvium. In the late 1950s, Mccown and his colleagues collected some lithic specimens from the riverbeds within the Narmada Valley (Jayaswal, 1978) and after studying this assemblage, Semans (1981) statistically compared Indian lithic assemblages with the old world's lithic assemblages. Sankalia (1974) and Khatri (1966a, 1966b) had done extensive surveys in the central Narmada Basin and Sankalia proposed that the conglomerates and fine-grained deposits primarily belonged to the fluvial facies from the Narmada River, rather than its tributaries. Armand (1983) excavated a lower Paleolithic site at Durkadi and reported several proto bifaces in addition to the Mode I assemblages and suggested that this indicated the evolution of the Acheulian technology in Peninsular India. Misra and his team excavated the middle Paleolithic site of Samnapur in the central Narmada Basin (1990). Ota (1992) surveyed the Narmada basin area and documented archaeological sites of various periods. Misra and Rajguru (1993) investigated the quaternary deposits at Bhedaghat near Jabalpur. Ghosh (1993) and Misra (1993) excavated Upper Paleolithic deposits at Mehtakheri. Joshi *et al.* (1978) investigated the quaternary animal fossils and stone implements from the central Narmada valley and found five new sites that yielded Lower Paleolithic to Mesolithic artifacts as well as Pleistocene mammalian fossils and made some stratigraphic observation and examined the raw materials and technique of making artefacts, which came from their studied locality. They also collected some fossils of the reptile species *Crocodylus palaendicus*, Gavialis sp., Trionyx sp. Khatri (1966a) found a large number of bones from the bank of Barurewa Nadi, a tributary of the Sher. The bones mixed with kankar and show slight fossilization. These slightly fossilized bones belong to the present day fauna and represent the youngest stage among the Narmada fossils. He found the same type of animal fossils which the researcher has mentioned above. Biswas (1997) proposed two mammalian faunal zones in the Narmada valley: Fauna from lower zone, presumably earlier to middle Pleistocene in age, includes *Stegodon namadicus, Equus namadicus*, *Sus namadicus*, *Hippopotamus namadicus*

and the homo specimens while the upper zone's age is Late Pleistocene to Early Holocene and has yielded *Equus hermionus kher, Hippopotamus palaeindicus and Hystrix crassidens.* A. R. Sankhayan of Anthropological Survey of India has made some important hominid fossil discoveries such as right clavicle, left Clavicle and 9th left Rib of hominids from Hominid locality Hathnora as well as partial hominid femur, a humerus from a new Stone Age locality Netankheri. The femur was recovered from the middle Pleistocene stratigraphic level (Sankhyan *et al.* 1997; 2005a; 2005b; 2012).

THE STUDIED AREA AND ITS PHYSIOGRAPHIC AND GEOLOGICAL CONTEXT

The site is situated in the Netankheri village of Sehore district of Madhya Pradesh located (22.50′25" N, 77.53′36"E) along the northern bank of the east-west flowing river Narmada 3 km east upstream from Hathrora village and 25 Km east of Shahganj. The site 'Netankheri' is named after the name of the village. The village is situated in Budni Tehsil in Sehore district and it comes under the Sardarnagar Panchayat. It belongs to Bhopal division. The district manifests typical topographical features such as undulating rolling downs of yellow grass and areas interspersed with rich black cotton soil. The main hill range of the district is known as Vindhyas, mainly towards the south. A little beyond the south of Vindhya range lies the plains of Narmada. The chief rivers of the district are Betwa and Parbati in the north and Narmada in the south and their respective tributaries form the river systems of the district's location in the drainage basin of Narmada and Yamuna. Narmada flows westwards over a length of 1,312 km before draining into the Gulf of Cambay, Gujarat, India. The Narmada basin, hemmed between Vindhya and Satpura ranges, extends over an area of 98,796 km^2 (38,145.3 sq mi) and lies between *longitudes 72° 32' E to 81° 45' E and latitudes 21° 20' N to 23° 45' N.* The basin covers large areas in the states of Madhya Pradesh (86%), Gujarat (14%) and a comparatively smaller area (2%) in Maharashtra. At Bhedaghat (23^{0}08′ N : 79^{0}48′E) near Jabalpur, Madhya Pradesh, the Narmada goes over a fall of about 9m (as a result of tectonic disturbance during the Tertiary and Early Pleistocene Period) and thereafter flows in the form of a saucer shaped basin between Bhedaghat and Handia near Hosangabad (22^{0}45′ N : 77^{0}45′ E). This portion of the valley is known as central Narmada valley. The district Sehore is situated in the central Narmada valley. The area that lies in between Jabalpur to Handia is said to be a deep rock basin, or a depression, which the Narmada has usurped for its channel and subsequently filled with sand and gravel.

Geologically, this valley is the only rift valley in India, running from east to west along the course of this river. The rift valley has the oldest rocks in the

world belonging to Precambrian and Paleozoic age. Narmada is the oldest river in the world due to its flow through the mountainous parts of the Gondwana Plate.

STRATIGRAPHIC OBSERVATION

Several scholars (Theobald, 1860; de.Terra and Paterson, 1939; Khatri, 1966a, 1966b; Supekar, 1968; Badam, 1979b; Biswas and Dassarma, 1981; Agrawal et al., 1989; Tiwari and Bhai, 1997) worked in Narmada Valley and they made different types of observation on its stratigraphic context. The most interesting observation about Narmada valley stratigraphy have been made by Tiwari and Bhai (1997). According to them, the Narmada Valley alluvial deposits are divided into seven lithostratigraphic formations. They identified the formations on the basis of various parameters such as order of superposition, erosional unconformity, nature of sediments, sedimentary structure, pedogenetic characters, etc. The formations are – Pilikarar formation, Dhansi formation, Surajkund formation, Baneta formation, Hirdepur formation, Bauras formation, and Ramnagar formation.

During the present study, Pleistocene stratigraphy of this region is understood from the naturally exposed sections of quaternary deposits. The Quaternary deposition of the studied area is alluvium in nature and fluvial in origin. These sections were studied at four different places at Netankheri. Descriptions of the composite stratigraphy as reconstructed from the sections are given below.

There are mainly two layers that have been observed. Layer 1 is the layer of cemented boulder conglomerate. In the studied area the lithological sequence begins with it. The thickness of this layer varies. It consists of stratified hard compact basal unit comprising of rock fragments of different shape and size of granite, quartzite, sandstone, agate, chalcedony, chart, basalt and calcareous nodules which are tightly cemented in the matrix of brown, red and grayish sand and silt. This layer is called 'Boulder conglomerate and gravel layer' (Khan and Sonakia, 1992). Lithostratigraphically it is designated as 'Surajkund formation' of Middle Pleistocene time (Tiwari and Bhai 1997).

During field investigation, three different sub-layers have been observed in the cemented boulder conglomerate bed. The sub layers mostly consist of pebbles and cobbles. They have different shapes. A striking geomorphological feature that has been observed during the present investigation is that the cemented gravel bed is collapsed and spread as a gravelly sand bar for a longer distance.

On the top of layer 1 there is another layer which consists of fine brown calcareous silt with grey sand and thick brown silty clay, coarse sand and small, more or less rounded pebbles. The thickness of this layer varies at the studied locality. According to Tiwary *et al.* (Tiwary and Bhai 1997), lithostratigraphically this layer is known as 'Baneta formation' of Late Middle Pleistocene to early Upper Pleistocene.

It is interesting to observe that the layer 1 of the studied area is fossiliferous and implementiferous. It is a high energy gravel layer because a large number of pebbles, cobbles and gravel are deposited in this layer due to river activity. Layer 2 is also implementiferous, but the concentration of fossil is low here. In the present study, large numbers of fossils have been noticed. During the course of fieldwork, it is observed that the artefacts and fossils are placed side by side on the surface of the cemented boulder conglomerate horizon.

ARCHAEOLOGICAL FINDINGS

During the present investigation, cultural evidences of prehistoric past have been recovered from both surface and in situ context. Most of the artefacts are recovered from surface collection. The number of artefacts which were recovered in situ are few and those are present in both layers. Altogether, 70 artefacts have been recovered from the Netankheri locality during the present study. Most of the artefacts have been found abundantly from the surface. Out of 76 artefacts, 21 are recovered from layer 1 and others are recovered from layer 2. Heavy duty tools were recovered from layer 1 and most of the light duty tools were found from layer 2. It was observed that a few flake artefacts were resting on layer 1.

Typology

Most of the artefacts were recovered abundantly from the surface and found in mixed condition. So the stratigraphic context of those artefacts is unknown to the author. The recovered artefacts have been classified as core, flake and tool. Out of 70 artefacts, there are 5 cores, 43 tools and 22 flakes. After detailed study on the tools it is evident that among 43 tools, there are 5 pebble tools, 31 flake tools and 7 blade tools. Out of 5 pebble tools, there are 3 hand axes and 2 choppers. Among 31 flake tools, there are 2 cleavers, 15 scrapers, 8 borers, 4 burins and 2 knives. After a study on the scrapers in laboratory, it was noticed that scrapers are typologically divided into side scrapers, double sided scrapers, end scrapers and side cum end scrapers. In blade tools, there are 3 flake blades, 4 blades and out of 22 flakes there are 8 retouched and 14 are unretouched flakes. It is observed that most of the heavy duty artefacts from Surajkund formation show Lower Paleolithic typological characteristics and

the artefacts from Baneta formation exhibited Late Middle Paleolithic to Upper Paleolithic characteristics.

Table 1
Percentage of Stone Age Artefacts

Artefact Types	*Numbers*	*Percentage*
Core	5	7.14
Flake	22	31.43
Tool	43	61.43
All Total	70	100

Table 1 shows that the percentage of tool is highest (61.43) and percentage of core is lowest (7.14) among the studied assemblage of Netankheri. The percentage figures of table 1 are reflected in figure 1 pie chart.

Figure 1: Percentage of Artefacts at Netankheri Site

Table 2
Percentage of Lithic Assemblage Based on Typology

Atrefact Types			*Sub Types*	*Numbers*	*Percentage*
Tool	Pebble Tool	Hand Axe	Almond	2	2.86
			Sub Triangular	1	1.43
		Total		3	4.29
		Chopper	Bifacial	2	2.86
		Total		2	2.86
		All Total		5	7.15
	Flake Tool	Cleaver	V- Shaped	1	1.43
			U- Shaped	1	1.43
		Total		2	2.86
		Scrapers	Side Scraper	6	8.57
			Double Sided Scraper	2	2.86
			End Scraper	4	5.71
			Side Cum End Scraper	3	4.28

contd. table 2

Atrefact Types		*Sub Types*	*Numbers*	*Percentage*
	Total		15	21.42
	Borer		8	11.42
	Total		8	11.42
	Burin		4	5.71
	Total		4	5.71
	Knife	Blunted Backed	2	2.86
	Total		2	2.86
	All Total		31	44.27
	Flake			
Blade	Blade	Unretouched	2	2.86
Tool		Retouched	1	1.43
	Total		3	4.29
	Blade	Unretouched	2	2.86
		Retouched	2	2.86
	Total		4	5.72
	All Total		7	10.01
CoreE	Core		5	7.14
	Total		5	7.14
Flake	Flake	Unretouched	14	20
		Retouched	8	11.43
	Total		22	31.43
Grand Total			**70**	**100**

Table 2 shows that among the tools which were recovered during the present study, percentage of flake tool is highest, that is, 44.27, which is far greater than pebble tool (7.15) and blade tool (10.01). From this table it is evident that among the tools, percentage of scraper is highest and it is 21.42. Also, its percentage is the highest among the flake tools and it differs to some extent from borer (4.28), burin (5.71) and knife (2.86). Among the blade tools, the percentage of blade is high and it is 5.72. The percentage figures of table 2 are reflected in figure 2 pie chart.

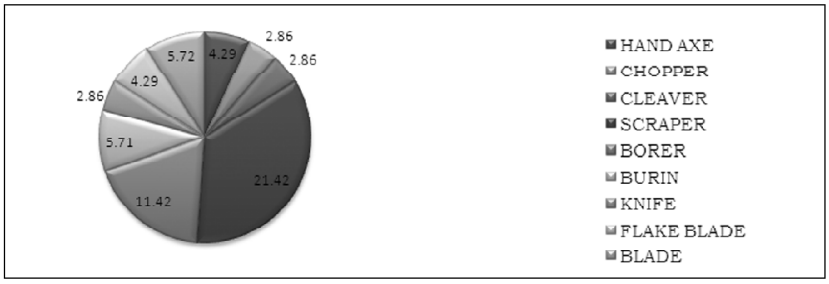
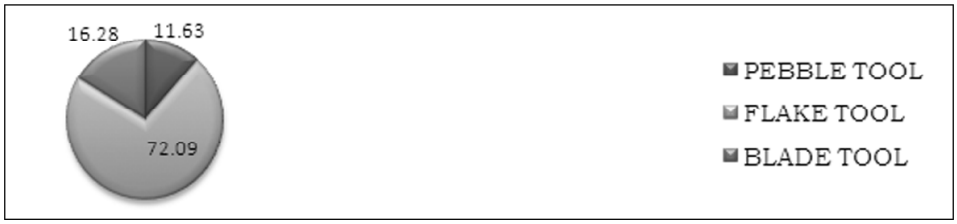


Figure 2: Percentage of Tool Typology at Netankheri

Table 3
Percentage of Tools based on Stone Tool Tradition

Tools	*Numbers*	*Percentage*
Pebble Tools	5	11.63
Flake Tools	31	72.09
Blade Tools	7	16.28
All Total	43	100

Table 3 shows that among the tools of the studied locality, the percentage of flake tool (72.09) dominates over pebble tool (11.63) and blade tool (16.28). The percentage figures of table 3 are reflected in pie chart.



STATE OF PRESERVATION

Most of the artefacts are found from the river deposits of Narmada. They are weathered and deeply patinated due to river action and nature of deposition. However the preservation of artefacts not only depends on the physical forces of nature and post depositional environment but also on the nature of raw materials that were used to make those artefacts as well as the relative age of the artefacts (Ray et al, 2010). During study, it is observed that artefacts from cemented boulder conglomerate bed show heavy rolling due to river activity. The rolled artefacts from this bed may indicate that the artefacts were transported fluvially from others places and deposited in this locality.

Large numbers of artefacts are recovered abundantly from layer 1. Very few are recovered in-situ. The artefacts which are found from this layer show edge damage. It has been observed that very few fresh artefacts were resting on this layer and found only occasionally. It suggests that the artefacts may have come from nearby localities through river and got deposited in this area. Fresh artefacts of this layer suggest minimum fluvial transport.

Artefacts from Baneta formation show less rolling. Most of the artefacts show low to moderate damage on their edge due to rolling, suggesting minimal fluvial transport. Few artefacts show no abrasion. No heavy duty artefacts have been observed in this layer.

Table 4
Percentage of types of preservation of the artefacts at Netankheri

Type of Preservation	*Numbers*	*Percentage*
Heavily Rolled	33	47.14
Medium Rolled	27	38.57
Fresh	10	14.29
All Total	70	100

Table 4 shows that the percentage of heavily rolled artefacts is highest (47.14) and the percentage of fresh artefacts is lowest (14.29) in the studied lithic artefacts of the site. The percentage figures of table 4 are reflected in figure 3 pie chart.

Figure 3: Percentage of type of preservation of the artefacts at Netankheri

RAW MATERIALS

Quartzite, quartz, chert, agate and jasper were used as raw materials for manufacturing the tool. During field investigation, a large number of above mentioned raw materials have been observed as pebble, gravel, cobble form and they are deposited on both the banks of Narmada at the studied area.

The heavy duty artefacts such as hand axes, bifacial choppers, cleavers and a few scrapers are made of fine grained vindhyan quartzite. The vindhyan quartzite in the form of gravel and cobble, which is reddish in colour, came from Vindhyan and Satpura hill region.

Flake tools are made of cryptocrystalline rocks such as chert, agate and jasper. A few flake tools are made of quartzite and quartz. The colour of quartz is whitish and various colours of chert and agate have been used for manufacturing the artefacts. Blade tools are mainly fashioned out of chert and very rarely of agate.

The availably of these raw materials at the studied locality suggests that prehistoric people of this region exploited the local raw materials extensively to manufacture artefacts. The following table shows the frequency distribution

of raw material types of the lithic assemblage of Netankheri which were found during the present field investigation.

Table 5
Percentage of raw material types in total lithic assemblage of Netankheri

Raw Material Types	*Numbers*	*Percentage*
Quartzite	20	28.57
Quartz	5	7.14
Chert	28	40
Agate	9	12.86
Jasper	8	11.43
All Total	70	100

Table 5 shows that the percentage of chert as a raw material is high (40) in total lithic assemblage of Netankheri. Out of 70 artefacts, 28 artefacts are made of chert. The second highest percentage of raw material type is quartzite and it is 28.57. The corresponding percentage of quartz, agate and jasper as raw material are 7.14, 12.86 and 11.43. The percentage figures of table 5 are reflected in figure 4 pie chart.

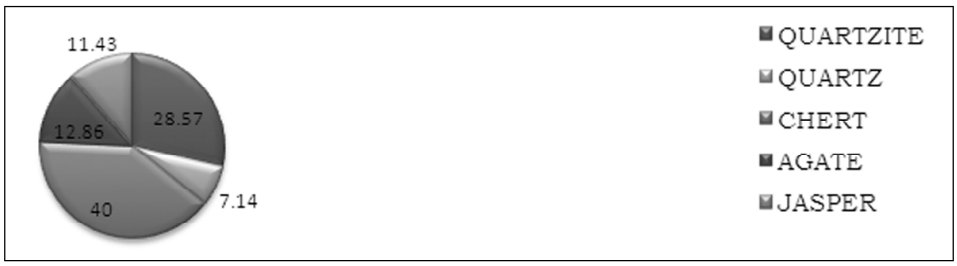


Figure 4: Percentage of raw material types used in total lithic Assemblage of Netankheri

Table 6
Percentage of raw material types used in tools of Netankheri:

Raw Material Types	*Numbers*	*Percentage*
Quartzite	10	23.25
Quartz	3	6.98
Chert	18	41.86
Agate	7	16.28
Jasper	5	11.63
All Total	**43**	**100**

Table 6 shows that the principal raw materials that were used to manufacture tools are Chert and Quartzite.

The percentage figures of table 6 are reflected in figure 5 pie chart.

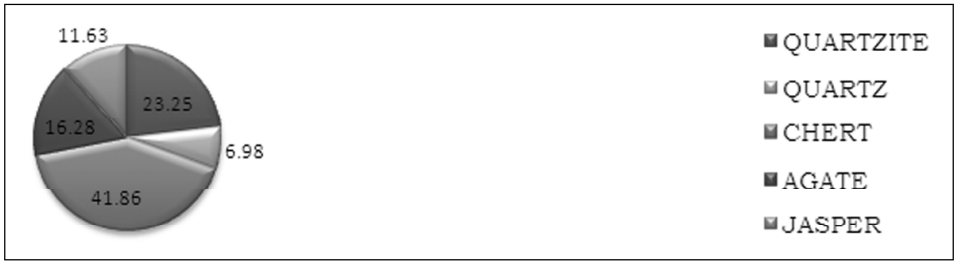


Figure 5: Percentage of Raw Material Types Used in tools of Netankheri

Table 6
Metric value of the artefacts

Artefacts		*Dimension*					
		Length(cm)		*Breadth(cm)*		*Thickness(Cm)*	
		Max.	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*
PEBBLE	HAND AXE	13.3	9.5	8.5	6	5.3	2.6
TOOL	BIFACIAL CHOPPER	10.2	9.1	9.3	8.8	5.6	4.6
	CLEAVER	13.7	11.2	10.1	8.2	3.7	2.9
FLAKE	SCRAPER	9.7	4.1	7.4	3.3	3.4	1.3
TOOL	BURIN	4.4	2.4	2.8	1	0.8	0.5
	KNIFE	7	5.2	3	2.6	1.3	1.1
	FLAKE BLADE	5.9	3.3	3.1	1.8	2.7	1.6
BLADE	BLADE	5.3	2.3	1.8	1.3	1.3	0.7
TOOL	FLAKE	5.6	2.9	3.7	2.8	1.7	0.6
	CORE	13	3.4	12.1	2.5	5.6	2

So far as the dimensions of the artefacts are concerned, the pebble tools are bigger and larger than flake tools and blade tools, but among the flake tools, the length, breadth and thickness of cleaver is close to pebble tools (see table 6). The table also shows that cores which are recovered from the study area are not small in terms of their dimensions. The mean values for the length, breadth and thickness of the flakes and cores are 3.94 cm, 3.1 cm, 1.1 cm and 7.98 cm, 5.68 cm, 4.2 cm.

Technology

Tools such as hand axes and bifacial choppers are made of pebble core. Hand axes have flake scars on both surfaces but the amount of flake scars in dorsal surface is high. Flake scars of the hand axes show that they are made through hard hammer percussion. Typologically, the hand axes look like other Early Acheulian assemblages in that they lack a sense of refinement and possess

thick mid-sections and large flake scars. Some flake scars are deep and some are shallow in nature along with small scars. During laboratory work, it has been observed that the edges of the hand axes have been obtained by irregular flaking along the margin. It is important to note that one Late Acheulian hand axe has been recovered during the present investigation.

The cleavers are made of large flakes. The flake scars of cleavers show hard hammer percussion. In case of chopping tools, large flake scars have been observed both in dorsal and ventral surface of the tools. The nature of the flaking suggests hard hammer percussion. The flake scars are irregular in nature.

Scrapers are made of flakes. During laboratory work on scrapers, it has been noticed that some scrapers have defused bulb of percussion, especially the scrapers which are made on chert, agate and jasper. It suggests that cylindrical hammer was used to manufacture the scrapers which are made on cryptocrystalline rocks. Most of the scrapers have both primary and secondary flake scars. Side scrapers and end scrapers show regular flaking along its working edges. The sizes of the flake scars are small and shallow. Some scrapers have slightly convex cutting edge and some have straight. During analysis, it was observed that end scrapers have step ended flake scars along its working area. A number of flake scars are seen on both dorsal and ventral surface of the side scrapers. Some scrapers show faceted platform.

Borers are also made of flakes. Most of the borers show defused bulb of percussion. It is noticed that two borers have faceted but small striking platforms. Presence of a lip like projection at the junction part between striking platform and bulb of percussion and the presence of defused bulb of percussion indicates that the flakes which are used to manufacture the borers were detached by the application of soft hammer technique. The dorsal surface of the borers possesses flake scars of various sizes. The flake scars are small in size. A few flake scars have been observed on the ventral surface of the borers.

Burins carry defused bulb of percussion and it suggests the use of cylindrical hammer technique. Two burins bear some working along the margins but the tip portion of those burins is unworked. The dorsal surface possesses flake scars of various sizes. Both primary and secondary flake scars are found from the tools. However, the secondary flakes are very few. The burins are generally worked on one end and are characterized by removal of vertical and oblique spalls which forms the working edge of the tool.

The knives are made of flakes. Flakes generally bear narrow and plain platform. The working edges of the artefacts present a number of flake scars on their dorsal surface. The opposite borders of the working edge of the knives

are blunt. A number of step ended flake scars are present in the blunt area of the knives. It can suggest that the step ended flake scars have been made intentionally by the prehistoric people of this region to blunt the opposite border of the working edge of the knives.

Blade tools such as flake blades and blades show tiny bulb of percussion. All the blade tools are made on flake. The dorsal surface of the tools carry more flake scars than ventral surface. Small flake scars are found in these artefacts. Both step and hinge flaking are noticed on the borders of the dorsal surface of the artifacts. The nature of the bulb suggests the use of soft hammer technique. Blades are more or less rectangular in shape with two parallel working edges. Dorsal surface of one blade has longitudinal flake scars. The ventral surface of the blades presents large bulbar scars with medium sized flake scars. From the nature of swelling of bulb of percussion and from the bending pattern of the flakes of the blades, it appears that these are side struck flakes. Striking platforms and initiation part of the bulb of percussion are absent in two blade tools.

The detailed analysis on cores shows that most of the cores bear scars over their bodies and few cores have some amount of cortex. Cores show large and deep as well as small flake scars. Cores prominently show negative bulb of percussion. The cores are divided into three categories namely, pebble cores, flake cores and blade cores. Pebble cores are large in size and flake cores, in most cases, are flaked along the periphery and have centrally directed flake scars. Blade cores show that few blades are detached longitudinally from the cores which possess shallow scars.

Both retouched and un-retouched flakes have been analyzed. Regular retouching has been found along the margins of some flakes. Small flake scars have been noticed in flakes. Some flakes are angular and a few are rectangular in shape; some flakes have concave shapes. Large flakes bear flake scars on their dorsal surfaces. Retouched flakes show both large, deep flake scars as well as small, shallow flake scars. Few flakes show cortical platform surface. Faceted platforms have also been observed in some flakes.

From the above detailed analysis of the recovered artefacts, it is evident that technological evolution of the stone tools occurred in the studied locality. It is clear that both primitive and advanced methods of tool manufacturing techniques have been used for manufacturing and refinement of artefacts. But the proper stratigraphic contexts of the artefacts remained unknown because most of the artefacts have been found abundantly from the surface.

During the present study, Early Acheulian artefacts were recovered from the cemented boulder conglomerate horizon. The late Acheulian hand axe

was recovered from the same horizon from where the Early Acheulian artefacts have been recovered. The hand axes are classified as Early Acheulian and Late Acheulian on the basis of morphology, flake scar type, and further refinements of the artefacts. Owing to the absence of proper stratigraphic contexts of the recovered bifaces, it is difficult to differentiate the Late Acheulian assemblages from the Middle and Early Acheulian types. During the present study, artefacts were generally collected from the surface where artefacts of various cultural periods are mixed. Therefore, for this situation, typological differentiation must be considered in the differentiation of tool complexes. From the present study area, Sankhyan (Sankhyan et al. 2010, 2012) found heavy-duty Early Acheulian artefacts as well as light-duty Late Acheulian implements. The recovery of Early to Late Acheulian artefacts have been reported from various Stone Age localities of Sehore district of Madhya Pradesh. For instance, from the hominid locality Hathnora, Salahuddin (1985) recovered some Late Acheulian artefacts from the cemented boulder conglomerate bed. From Sardarnagar locality, Patnaik and his colleagues (2008) recovered Acheulian artefacts. They also recovered Acheulian artefacts from Gurla locality. According to Misra (1975), the cemented boulder gravel bed has yielded Early to Middle Acheulian artefacts elsewhere in central Narmada valley. During the present investigation, the artefacts from the naturally exposed sections at Netankheri locality exhibited Lower Paleolithic as well as Late Middle to Upper Paleolithic typological characteristics.

CONCLUDING OBSERVATION

The story of man began in Miocene period around twenty million years ago, and the most important thing is that he has learnt to use various raw materials available in nature, such as stone, wood, bone, clay, metal etc. and shaped them into useful objects to satisfy his needs. Like other creatures, humans too have had to adapt themselves to the environment in which they live. It is observed that in India, prehistoric settlements have been found in many eco-geographical locations such as plateau areas, sand dune regions, rock shelters, foothill regions, alluvial plain lands, coastal areas, lake shores etc. In Narmada valley region, it is evident that prehistoric people occupied this area in the remote past and stayed here for a long period, because from this valley, a large number of Stone Age assemblages ranging from Paleolithic to Neolithic have been recovered. So, these discoveries as well as the present study reveal that cultural evolution of Stone Age tools have occurred in this area because stone tools of various tool traditions have been recovered during the present investigation which represent various cultural periods of the prehistoric past. It can be suggested that this area was chosen by our early ancestors for mainly

two reasons, namely, availability of water as well as good quantity of food resources.

In Tropical regions like Indian Subcontinent, during Pleistocene, most of the lands have experienced wet and dry climatic cycles. The wetter cycles are called fluvial periods and dryer cycles are called inter-fluvial periods. The effects of altering wet and dry cycles are many. The increasing and decreasing flow of water in rivers brought forth different effects on the landscape. The forces of water flowing in the rivers transported large amount of gravel, boulders, pebbles, silt and many other things and deposited them in the river banks as well as river beds. During the present investigation, similar types of geomorphological features have been observed at Netankheri locality. So, from the observation, it can be surmised that the Netankheri area of central Narmada valley witnessed fluvial and inter fluvial periods of Pleistocene epoch of Quaternary era.

From the analysis of the recovered artefacts of Netankheri locality during the present investigation, it can be concluded that the prehistoric people of this region made use of these artifacts for their subsistence. Primarily, convex edge tools prepared in the simplest way by shaping the edge, would be useful for climbing trees to collect fruits by making notches in the tree trunk, breaking and grinding nuts and seeds, collecting honey, trapping insects and small animals, and preparing receptacles of bark and wood, digging roots and fishing. The early man of this region was hunter who chased big game and fought and defended himself against enemies of all types. The heavy-duty tools were also used for gathering food. The heavy butted hand axes used as digging tools might have also been used for grubbing purpose, cutting up animals and dressing their skins, whereas the flat triangular tool with sharp edge could have served as a lance head. The cleavers with heavy butt and straight or convex cutting edge might have been used for cutting and chopping. Probably cleavers as well as hand axes were the meat mattock and used for dealing with thick skinned large animal. Sometimes cleavers were hafted in wood or bamboo. The choppers were mainly used for chopping the meat and for breaking the bones to extract the marrow. Scrapers might have been used for dressing the skins of animals and smoothing tree trunks and for skinning the games. Flake tools were mainly used for specific works. Detailed analysis of the artefacts of the studied locality demonstrate the direct evidences for the hominin adaptive strategies throughout much of the Pleistocene epoch, including changing raw material exploitation and transport as well as stone tool production and utilization.

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