

Lower Palaeolithic in Rajasthan: A Preliminary Study

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Abstract: Rajasthan has been a centre of human's activities since prehistoric period, evidenced by the collection of prehistoric tools from all over the parts of the state. This also implies that the area was inhabited by the primitive man for livelihood. In the state, there is evidence of all the three stages of the Palaeolithic, namely, Lower, Middle and Upper. Most of the sites are surface sites and are represented by stone tools only. There are no evidences of animal or plant remains or structures from excavated palaeolithic sites. We have only evidences of stone tools which they manufactured and used and the kind of landscape and climate in which they lived. This article is based upon the collected data on lower palaeolithic culture of the state which indicates that there is more work to be needed in this area from archaeological point of view.

Keywords: Stone Tools, Palaeolithic, Rajasthan, Technology, Evolution.

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INTRODUCTION

The panoramic outlook of our state is simply mesmerizing; with lofty hills of Aravalli's - one of the oldest mountain ranges of the world and the golden sand dunes of the Great Indian Desert - the only desert of the sub-continent with one edge paralleling the Sutlej-Indus River valley along with its border with Pakistan. The state borders Pakistan to the west, state of Gujarat to the southwest, Madhya Pradesh to the southeast, Uttar Pradesh and Haryana to the northeast and Punjab to the north. The state covers an area of 342,269 km²; is located in the north-western part of India between 23° 3' to 30° 12' north latitudes and 69° 30' to 78° 17' east longitudes. The capital city is Jaipur.

The Aravalli hills form the sky-line of north-west India i.e., Gujarat, Rajasthan, Haryana States and Delhi Union Territory stretching from south-west to north-east, extending from Palanpur in Gujarat upto Delhi Union Territory through Rajasthan and Haryana state. They form the main water divide of the north Indian drainage system. At few places in the Aravalli range, the hills are discontinuous and gaps exist. In the absence of the adequate forest stock on the Aravalli hills, these gaps turned active and caused drifting of desert sand towards fertile plains engulfing parts of 'Granary of India' consisting of eastern Rajasthan, Punjab, Haryana, Delhi Union Territory and western Uttar Pradesh. The northwest tract is sandy and unproductive with little water, but improves gradually from desert land in the far west and northwest to comparatively fertile and habitable land toward the east. The area includes the Thar (Great Indian) Desert.

Geologically the state is highly varied and complex, revealing the co-existence of the most ancient rocks of Pre-Cambrian age and the most recent alluvium as well as wind-blown sand. The Aravalli have the oldest granite and gneissic rocks at their base, overlain by the rocks of the Aravalli Super group, Delhi Super group, the Vindhyan Super group and younger rocks. These rocks are highly metamorphosed at certain places and show rich occurrences of minerals of great commercial importance.

PREHISTORIC CULTURE: INTRODUCTION

On the basis of technology, the human past is divided into the three ages of stone, bronze and iron. The Stone Age is again divided into three stages, namely, Palaeolithic or Old Stone Age, Mesolithic or Middle Stone Age, and Neolithic or New Stone Age. The three stages of the Palaeolithic viz, Lower, Middle and Upper, are now firmly established in the Indian subcontinent. The Lower Palaeolithic forms the earliest hominid cultural stage in India as elsewhere in the Old World. This cultural stage was variously named as Early Stone Age (Subbarao 1958), Series I (Cammiade and Burkitt 1930: 327-39) and Chopper-Biface element (Ghosh 1970: 1-68, 1974: 221-34). It has now been finally realized that the European system of dividing the Stone Age into Palaeolithic, Mesolithic and Neolithic phases and subdividing the Palaeolithic into Lower, Middle and Upper cultural stages is more appropriate to the Indian evidence also (Misra 1962a: 113-24, 1989: 17-64). The distinction between Palaeolithic and Mesolithic is made mainly on the basis of the form of tools and the secondary techniques of making them. The basic technique of making the tools during both the periods was flaking or chipping. The Neolithic or New Stone Age is different from Palaeolithic and Mesolithic in respect of technology, economy and social organization. The Neolithic people made their tools not only by flaking but also by pecking and grinding. They made axes, adzes and chisels which after initial flaking, which produced the broad outline of the tool, were ground on stone to produce a sharp edge and smooth, even surface. The axes and adzes were hafted in wooden handles for use. Alongside, the Neolithic people also continued to use older tools made on flakes, blades and micro-blades. More importantly, they started domestication of animals and cultivation of plants. They became food producers and permanently settled in villages as against the nomadic lifestyle of their Palaeolithic and Mesolithic predecessors, although they continued to practice hunting and gathering also, though on a much-reduced scale.

The oldest known tools have been reported from the Siwalik hill at Riwat, near Rawalpindi in Pakistan. Collected tools have been dated to two million years on the basis of magnetic polarity stratigraphy (Rendell and Dennell 1985: 393; Rendell *et al.* 1987: 488-496). The earliest reliable stone tool assemblages belong to two distinct cultural and technological traditions, namely (i) the Sohanian and (ii) the Acheulian.

The Sohanian culture is named after the river Sohan (or Soan), was found at a number of sites in the Siwalik hill in northwest India and Pakistan. The site was first reported by De Terra and Paterson (1939).

The first effective colonization of the subcontinent was accomplished by the makers of the Acheulian culture, named after the French site of St. Acheul. The remains of this culture have been found extensively from the Siwalik hill in the north to areas near Chennai in the south (Misra 1987a: 99-119). Acheulian hunter-gatherer populations adapted themselves to a wide variety of ecozones includes the semi-arid regions of western Rajasthan, Mewar plain, Saurashtra, Gujarat alluvial plain, subhumid dry etc. (Misra 1989: 17-64). Chemical analysis of the sediments yielding Acheulian assemblages in rock shelter III F-23 at Bhimbetka, one of the world heritage sites of the country, in Madhya Pradesh suggests that conditions during the Acheulian occupation were as humid as, if

not more than, they are today (Rajaguru 1978:103–4). Therefore, both plant and animal life must have been abundant. Faunal fossil evidence from the alluvium of the Narmada, Godavari and their tributaries supports this inference (Badam 1979). In the semi-arid region of western Rajasthan sites, now buried in finegrained alluvium around Didwana in Nagaur district, Acheulian hunter-gatherers camped along lakes and pools in the wide flood plains of shallow meandering streams, on the surfaces of extensively exposed older gravel beds and on stable sand dunes (Misra 1987b, Misra and Rajaguru 1986: 407–437). It appears that the rock shelter and open-air sites represent seasonal camping places of the populations. Over most of the country, however, the Acheulian hunter-gatherers lived in the open along perennial as well as seasonal streams.

Acheulian tool assemblages comprise choppers, chopping tools, polyhedrons, spheroids, discoids, handaxes, cleavers, scrapers, denticulates, notches, flakes, blades and cores. Though our knowledge of most of these tool types is imperfect, it is certain that they served a variety of functions like hunting, butchering and skinning of animals, breaking bones for extraction of marrow, digging of roots and tubers, processing of plant foods, and making of wooden tools and weapons.

PALAEOLITHIC CULTURE IN RAJASTHAN

In Rajasthan there is evidence of all the three stages of the Palaeolithic, namely, Lower, Middle and Upper. Most of the sites are surface sites and are represented by stone tools only. There is no evidence of animal or plant remains or structures from excavated sites. We have also no data about the kind of food which the Palaeolithic people ate or the kind of dwellings or structures they lived in. We have only evidences of stone tools which they manufactured and used and the kind of landscape and climate in which they lived.

LOWER PALAEOLITHIC

Tool Typology

The tool typology of the Lower Palaeolithic culture consists of handaxes, cleavers, choppers, scrapers, discoid, polyhedrons, spheroids, etc. Among these types handaxes and cleavers of a variety of shapes and forms dominate.

The most diagnostic tool type of the lower palaeolithic culture is the handaxe with its various subtypes. It is invariably thick at one end (butt) and pointed at the other end (tip). Cleaver is the next important tool type. This tool is characterized by an axe-like broad cutting edge which is usually at right angles to the long axis. The other major typological forms are choppers (both unifacial and bifacial) and scrapers. Cleaver tool is comparatively developed and mostly appear later than choppers and handaxes. These tool types are found to occur in different proportions in the Lower Palaeolithic assemblages from different parts of the state. It is possible that tool types partially represent specific needs of the people (Ghosh 1985: 29-34).

The probable functions of the tools can only be speculated by their shape and form. It is also assumed that these tools were not directly useful for hunting purposes. They were perhaps employed in preparing larger weapons on wood and bone for utilization. The tool of handaxe is multipurpose which was used for skinning and cutting animal carcasses; pointed tips for digging up roots and tubers and for opening up the bellies of animals; and the heavy butt for crushing purposes. Chopper tool was used for chopping and cutting meat and other organic materials while scraper was used for scraping of barks of trees and dressing of animal skins. Cleaver was primarily used for cutting up meat and bone and possibly also for cutting trees.

TECHNOLOGY

The techniques employed for making stone tools from pebbles and cores into finished forms during this period. At that time, three main techniques were in use viz., the block-on block, stone hammer and soft hammer or cylinder hammer. The first technique was employed to obtain large massive wide-angled flakes. A rough outline of the tool was achieved by means of heavy stone hammer technique. The desired shape of the tool was further obtained by means of light stone hammer technique. Final finishing, dressing and trimming were made by soft hammer. The majority of flakes were detached from the blanks by the Clactonian technique which consisted of the removal of flakes by direct percussion. A few tools suggest the use of prepared core technique (Levalloisian) in which a flake is shaped prior to its detachment from the nucleus.

RAW MATERIAL

Raw material has its own importance in the life of human being. Quartzite stone was the first priority of lower palaeolithic man for making the tools. Scrapers, handaxes and cleavers are the main tool of the primitive man. The lower palaeolithic industry was based on core tools while middle palaeolithic tools are made on flakes. The distribution of Lower Palaeolithic sites is closely related to regional geological formations. The tool-makers showed a preference for quartzite as the main raw material for making artefacts because of its hardness and good flaking qualities. The quartzites, being hard and resistant to weathering, form well rounded pebbles due to transportation in the media of sand and running water. Pebbles of suitable size, pebble flakes and blocks of quartzites obtained from natural outcrops were selected by Acheulian men for preparing the desired tool types.

DISTRIBUTION OF LOWER PALAEOOLITHIC SITES

It was first time in the state when C.A. Hackett of the Geological Survey of India discovered a few Acheulian palaeoliths from Jaipur, Bundi and Indergarh. Some of them have been recorded by J. Goggin Brown in the catalogue of Indian Museum at Calcutta (Brown 1917: 66-7). Setton Karr found small number of Acheulian tools in Jhalawar in 1928 (Setton-Karr 1928: 122). Though these discoveries were important but the exact dates, the find spots and the context of the tools are unknown.

In 1953-54, M.N. Deshpande explored the beds of the rivers Gambhiri and Berach near Chhitorgarh, the two streams near Singoli, the pebble conglomerate bed of the Chambal and the slopes near the village of Sonita, choppers, handaxes and cleavers were discovered (*JAR*1953-54: 37).

Further in 1954-55, Shri S.R. Rao of Archaeological Survey of India discovered six palaeolithic sites in Chhittorgarh district. Apart from a large number of tools found in the beds of river Gambhiri, Berach and Chambal at places like Chhitorgarh, Nagri and Sonita, the rivers Bamani and Ruparel and nallas of Dodha and Parsoli yielded considerable numbers of palaeoliths. He observed "south Rajasthan seems to have been a pivotal region where both the Sohan industry of Panjab and the Madras handaxe industry met. The sequence of cultures noticed in Gujrat, viz., the occurrence of microliths on the river banks and of palaeoliths in the river beds, was confirmed in Rajasthan. Some tools were found at Bichore in the Parsoli nalla, which joins the river Bamani. Handaxes and cleavers were the main types". A few implements were picked up at Haripura. Rathanjna, an important site near Nimbhahera, situated on the Gambhiri, yielded a large number of handaxes, besides clearvers and choppers. The palaeolithic site at Sigoh, also near Nimbhahera, is on the bank of the Kadmali. Tajpura on the Ruparel, was found to be rich site with a large number of cleavers but a very few handaxes. The site at Dhangadman, situated on the Pipla-Ka-Nalla, yielded a few implements, consisting of pebble tools, Abbevilleo-Acheulian handaxes, late Achulian handaxes and Levalloisian flakes (*JAR*1954-55: 58). In 1955-56,

Shri K.V. SoundaraRajan discovered a palaeolithic site on the banks of the SanwanNadi, an affluent of the Chambal, near Bhangarh, District Alwar (*IAR* 1955-56: 68).

Two relatively undisturbed bearing deposits in the Chambal valley, at Sonita and Bhainsrorgarh respectively, both in Chittaurgarh district, were excavated in the 1956-57 by the western circle, under Shri S.R. Rao. The tools found in the conglomerate consisted of choppers, cleavers, scrapers, and ovate, the three being of indeterminate shapes. The flakes included those of the Clactonian technique. Thus, the existence in the area of Sohan choppers and Madras (Acheulian) bifaces with Clacton flakes was amply established. In the same year, the exploration branch of ASI, under K.N. Puri, explored parts of Udaipur and Chhittorgarh districts. Palaeoliths were collected from the valleys of Gambhiri, Wagan and Berach- at Chittor, Khor, Biawar and Nagri, all in Chhittorgarh District. They represented a mid to late Achulian stage of bifacial handaxe-cum-cleaver industry, comprising tools made on quartzite flakes and cores alike, with a small percentage of pebble tools (*IAR* 1956-57: 5-8).

In 1957-58, a *nullah* near Bichore yielded palaeoliths in large numbers was explored. Further north of Bichore, palaeolithic tools, mostly made on flakes and heavily rolled were found from nearby Shamaria village. They included ovates and cleavers, besides a fine specimen of the Acheulian handaxe. Two scrapers were the only specimens of core tools (*IAR* 1957-58: 45).

In 1958-59 Shri V.N. Mishra of the Deccan College Post graduate and Research Institute, Poona explored the valleys of the Luni and Banas and their tributaries in southern Rajasthan. As a result, twenty-one new palaeolithic sites of series I and series II were brought to light, the tools of the later series comprising scrapers, being confined. Besides factory sites of the later were found at Pichak near Bilara on the Luni and at Dhaneri near Sojat on the Lilri. Other tributaries of the Luni which yielded tools were the Bandi, Guhiya and Reria (*IAR* 1958-59: 42). Nine sites found on the bank of river Banas in Bhilwara and Tonk districts yielded tools of series I comprising huge pebble cores, scrapers, choppers, handaxes, cleavers and Clactonian flakes. The site of Chhittor on the Gambhiri was re-examined and many tools were found in the gravel in a gully below Bhilai- Ki-Jhopadian near the fort (*IAR* 1958-59:45).

Many tools were found *in situ* in the cemented gravel at Sarupganj (*IAR* 1959-60: 39). In 1960-61, a flake was found *in situ* in the gravel to the south of the Nathdwara town. Several implements were also found *in situ* at Bigod and Chittorgarh. A few stary elements were found from Govindgarh on the Sagarmati in district Ajmer. The tool assemblage, included some late Acheulian handaxes, and a few choppers and scrapers technologically recalling the pebble tools of the handaxe cleaver culture. The discovery of two sites by Shri N.M. Ganam, as far as west as Barmer points to the possibility of the existence of more sites in Jaisalmer and Barmer districts (*IAR* 1960-61: 30-31).

In 1961-62, the Director of Archaeology and Museums, Government of Rajasthan explored and discovered *in situ* early Stone Age implements at Dhigaria between Bairat and Thanagazi in District Jaipur. Dr. H. D. Sankalia, Dr. Z.D. Ansari and Shri S.N. Rajguru of the Deccan College, Poona explored some stretches of the river Bagan and Gambhiri. At places, a mixed assemblage of early and middle Stone Age tools was found. Most of the tools were made of quartzite and appear quite fresh. The river Gambhiri was surveyed to a distance of about 2.40 kilometer downstream from the road bridge near the Chittor town. The lower portion of the gravel yielded ten tools, mostly handaxes and cleavers. On the right bank of the river, three tools of the early stone age were found in the cemented gravel. The loose gravel from the river bed yielded a large number of the tools of the same assemblage, viz. handaxes, cleavers, scrapers and choppers, including miniature handaxes and cleavers cum handaxes. The tools showing less rolling are mostly made of quartzite, which is quite abundant in the form of pebbles in the river bed itself (*IAR* 1961-62: 38).

In 1960, the site of Bairath was visited by A. Ghosh, then Director General of Archaeological Survey of India with the proposed excavation in the present township, was of opinion that this valley seems to be an ideal place for the habitat of palaeolithic man. With this background, Shri K.N. Dikshit (Dikshit 1966-68: 26-30, *IAR* 1962-63:70) explored the valley thoroughly and brought to light Stone Age industries, natural caves and rock shelters.

Bridget Allchin of Cambridge University, A.S. Goudie of Oxford University and K.T.M. Hegde of M.S. University, Baroda carried out field-work in Gujrat, western Rajasthan and Pakistan. On the dunes surrounding the lakes at Hokra, Budha (old) Pushkar and Madhya (Middle) Pushkar the team found stone tool assemblages ranging from Lower Palaeolithic to Mesolithic, mostly on the surface. The team also located a number of small Palaeolithic and Mesolithic sites in Jalor, Pali, Jodhpur, Jaisalmer and Bikaner districts. The artefactual material collected by the team from the surface (Allchin *et al.* 1978).

In 1976-77, Dr. V.N. Mishra, S.N. Rajguru and Shri P.K. Thomas of the Poona University and the Deccan college, Poona in collaboration with Shri Subrata Sinha and his colleagues of the Quaternary and Environmental Geology division of the Geological survey of India, Jaipur and Dr. Gurdipsingh of the Australian National University, Canberra carried out preliminary survey, as a part of the multi-disciplinary project on the "Early Man and his Environment in north western India with special reference to the Luni Basin in Rajasthan". The field studies were concentrated around Sambhar and Pushkar lakes and in the Luni valley at Nand and Govindgarh in district Ajmer and at Benara in district Jaipur. The field work showed that there are well developed Pre-Pleistocene preplain surfaces in the area and the streams flowing over them have widely winding course in broad shallow valleys (*IAR* 1976-77: 46).

A few lower palaeolithic tools, including a fine cleaver, were discovered in a well cemented hill slope deposit, occurring in a cutting of an irrigational canal near Bhadrarjun, 23 kilometers south west of Pali (*IAR* 1977-78: 45-46).

In 1981-82, Narayan Vyas and S.C. Saran of the western circle of the Archaeological Survey, explored the banks of the river Bilas, a tributary of the Parvati, A large number of palaeolithic implements comprising handaxes and cleavers were collected (*IAR* 1981-82: 56).

In the course of the exploration in Chittaurgarh taluk, S.R. Shrimali of the western circle brought the Early Stone age tools from Surajpol and Chitori (*IAR* 1982-83: 67). The Department of Archaeology and Museums, Government of Rajasthan under the supervision of Vijai Kumar explored early Stone Age sites Bilwari in Jaipur district and Bhojka in Jaisalmer district in 1983-84 (*IAR* 1983-84:71). The excavation branch (V) of the Archaeological Survey of India, under B.R. Menaa conducted explored from vijayanagar to Malkot along the upper reaches of the rivers Khari and Mansi, the tributaries of the Banas, with a view to knowing the extension of the Ahar culture and archaeological potentiality of the region. Palaeolithic tools were reported from Katar and Garhwa of Bhilwara district (*IAR* 1984-85: 66-69). In 1984-85, V.N. Misra, S.N. Rajaguru, Hema Raghavan, S.K. Tyagi and D.R. Raju of the Deccan College Post-graduate and Research Institute, Pune and Claire Gaillard of C.N.R.S., France, carried out geological, archaeological and ethnoarchaeological studies in general in Jaisalmer and Nagaur Districts, and particularly around Didwanain District Nagaur. A few Late Acheulian artifacts consisting of a diminutive handaxe, core and flakes on quartzite were found in a calcareous clay deposit resting unconformably on siliceous limestone of pre-cambrian age at Rupnagar, 20 km north of Kishangarh in District Ajmer (*IAR* 1984-85: 72-75).

During the course of prehistoric exploration in south eastern part of Jaisalmer district and adjoining north eastern part of Barmer district, the Jaipur circle of Archaeological Survey of India, under the direction

of B.R. Meena and co-direction of Alok Tripathi, assisted by Kanwar Singh, B.R. Singh, Rajendra Yadav and R.P. Mathur reported the palaeolithic tools from Mehreri Navi, Olecha, Adam Khan ka Dera, Barli, Bhainsra, Bhagu ka Gaon, Barorgaon, Bhope ki Dhani, Bilia, Gudi, Inder Singh ki Dhani, Kelawa, Kunda, Luna, Madasar, Mahesha, Malusar, Marwa, Mehreri, Modha, Moklat-1, Nananiyai, Pokran, Rajgarh, Rasla, Sanawra, Sankara, Solankio ki Dhani-1, Solankio ki Dhani-2, Sujansingh ki Dhani, That, Uttam Singh ki Dhani etc (*IAR* 1999-2000: 132-136).

Under the village-to-village survey scheme, B.R. Singh, Nayan Anand Chakraborty, Sangita Chakraborty, Rajendra Yadav and R.P. Mathur, under the supervision of C. Dorje and D.N. Dimri of the Jaipur Circle of the Survey conducted survey in the ChhipaBarod tehsil along the Lhasi river and its catchment area and in the Chhabra tehsil along the Parvati River basin and the Bamanika Kheri in District Jhalawar and explored forty-one villages in ChhipaBarod and Chhabra tehsils of the district. Lower Palaeolithic tools were collected from the villages of Nayagaon, Banjari, Kumbhakheri, Kalpa, Nayapura, Sailkur, Uncawad, Bamanika Kheri etc (*IAR* 2002-03: 202-228).

Recent researches in northern Rajasthan have shown that the area is surprisingly rich in archaeological remains of prehistoric man. The lower palaeolithic tools are collected from Sohanpura, Bheetaro, Kala Bhata Balaji, Salahadipura, Kot, Shobh (Chaneja Ki Dhani) and Panihariwas in Sikar district; Reedh Ka Tila (Tyonda Rampura), Badalwas (Peer Baba Ki Bani), Bhairun Baba Ki Bani, and Kot in Jhunjhun district are reported in last few years. Dingharia, Bhoopsera, Chula, Kala pahar and Jhirna (Sharma & Meena 2004: 47-52) are also newly discovered Stone Age sites (Sharma 1997: 25-35, 2001) in Alwar district.

The area between Suket and Mukandara hills in Kota and Jhalawar district is a lime stone region. This region is also rich in artifacts of lower palaeolithic culture point of view. It appears to be one of the most potential regions for understanding different facets of palaeolithic cultures.

In 2019, palaeolithic assemblage includes lower palaeolithic type tools handaxe, cleaver, trihedral pick, spheroid, large flakes and cores, core tools etc. were collected around the Madhopura, Neran, Khuhra, Sadrasar and Madasar villages of southeast Jaisalmer area. About a dozen handaxes of different sizes and made on a variety of raw material were found in the riverbed and around a rocky hillock outcrop nearby. Some of them are unifacial, and some others are partly covered by cortex on one side. A large number of cores including discoid, unidirectional, bidirectional and prepared core were found (Devra *et al.* 2019: 126-132).

EXCAVATED SITES

Excavations at Jayal

One of the major finds in 1977-78 season was the discovery of an extensive gravel in the vicinity of Jayal, small town 52 km east of Nagaur and of probably the earliest human occupation in the area. The entire gravel ridge was found to be a very rich in palaeolithic tools. In order to establish stratigraphic position of the tools, small trenches (1 x 1 meter) were sunk at various locations. Further, surface samplings were also completed at one spot where there was relatively higher concentration of tools. Among the four trenches sunk on the gravel ridge, situated in the revenue jurisdiction of Jayal, the first trench (Jayal 1) was on the top of gravel ridge, while Jayal II, III and IV were on another gravel ridge. The artefacts are all made of quartzite. A preliminary analysis of the material from the trenches shows that among the finished tools scrapers formed the largest group followed by handaxes. Other types represented are choppers, chopping tools, denticulates, notches and knives (Mishra 2007: 109-110, Misra *et al.* 1980: 19-31).

Excavations at Chhajoli

The excavation carried out at Chhajoli, 2 kilometers south west of Jayal, yielded similar industry. Three small trenches were dug on the top and slope of the gravel ridge near Chhajoli village. Here artifacts occurred down to a depth of 2.30 meter. The main tool types are handaxes and scrapers while other types comprising choppers, chopping tools, denticulates, knives and truncated flakes. The assemblage is essentially similar to that of Jayal (Mishra 2007: 111).

The findings at these two localities prove beyond doubt that the gravel is older than the palaeolithic occupation. The percentage of finished tools in the surface collection is very high. The principal tool types are scrapers, truncated flakes, knives, discoids, handaxes, denticulates, choppers and chopping tools. There are only two cleavers (*IAR* 1978-79: 31-33)

During 1979-80, three important palaeolithic sites were discovered near Didwana town. These are Singi Talav, a large shallow depression, 1.5 km south-west of Didwana; lime quarries in the Amarpura village, 1 km west of Didwana railway station and dug out debris of the abandoned Bangar canal near the hamlet of Indola-Ki-Dhani, about 1.5 km east of locality 1. Subsequently in 1980-83, excavations were carried out at (1) Singi Talav, (2) Indola ki Dhani, and (3) on the southern bank of Bangar canal. During this work, artifacts were also collected from lime quarries of Amarpura village.

Excavations at Singi Talav

From 1980-81 to 1984-85, the excavations were conducted on the western edge of Singi Talav quarry, artifacts made on vein quartz and quartzite were found all through the deposit. On the basis of stratigraphy and typology two horizons were recognized: one between surface and 15 cm and the other between 15 cm and 120 cm. The assemblage of horizon 1 consists of small flakes and scrapers and can be assigned to the Middle Palaeolithic. In horizon 2 an assemblage of handaxes, choppers, chopping tools and polyhedrons was found. On typological and technological grounds this assemblage represents an early Acheulian stage. The artefacts are remarkably fresh suggesting that they were used and possibly made near the find-spot (Gaillard *et al.* 1983: 112-130, 1985: 141-152, 1986: 189-214, *IAR* 1980-81: 57-63; 1981-82: 58-59; 1982-83:69; 1984-85: 73-74; Mishra *et al.* 1982: 72-86).

Excavations at Indola Ki Dhani

At Indola Ki Dhani, digging was done to a depth of 5.15 meter and the deposit was divisible in six layers. Stone artefacts were found in all the layers of the Amarpura Formations but a part of layers 4 and 5 (385-445 cm) was sterile. Three archaeological horizons can be recognized in this deposit from below upwards. Horizon 3 yielded 1 finished tool, a chopper; thus, the assemblage cannot be culturally specified. Horizon 2 yielded artefacts include handaxes, points, scraper, choppers, chopping tools, polyhedrons and knives. The high percentage of debitage shows this horizon to be of the nature of a workshop. The higher proportion of flake-tools like scrapers and points and the smaller size of tools in comparison to the Acheulian industry of Singi Talav suggests this assemblage to be of late Acheulian character. Horizon 1 yielded 266 artefacts, include discoids, choppers, denticulates and specimen each of scraper and point. The absence of handaxes and polyhedrons and the generally smaller size of the tools in comparison to those of Horizon 2 suggests that this assemblage to be of the Middle Palaeolithic Age (Mishra 2007: 115).

Rich Acheulian industries were also found in the Amarpura formation in the Amarpura quarry in the excavated debris of the Bangar canal near Didwana and at Jankipura and Koliya, east of Didwana.

Excavations at Bangar Canal (16R)

Another excavation was done along the eastern bank of the Bangar canal at 16 R point between Didwana and MarwarBalialia village mainly to expose the stratigraphy of the dune. Digging was done to a depth of 10.2 meter without reaching the base of the dune. The trench revealed three lithological units (*IAR* 1980-81: 59-61, 1981-82: 56-58, 1982-83: 68-69).

The industry, made of quartzite and quartz, consists mainly of flakes and blades. Finished artifacts include scrapers, handaxes, chopping tool, cleaver, notch, and point. The density of artifacts represents a regular occupation and not casual human visits. In terms of the technology and size of artifacts, and the stratigraphic position, the industry belongs to a late Middle Palaeolithic or Early Upper Palaeolithic stage.

Excavations at Astoli

In 2006-07, the Acheulian site of Astoli (25°25' N; 75°34' E) is 7 km to the west of district Bundi was excavated jointly directed by Sheila Mishra of Deccan College and Riza Abbas of the Indian Rock Art Research Centre, Nashik, assisted by Sushama Deo, Shobha V, Prabodh Shilwarkar and Tosha Bantha. The Acheulian artefacts are found in a quartzite rubble deposit exposed by the Astoli nala to the west of the village. The main objective of the excavation was to understand the typo-technology and frequency of cultural material belonging to the Acheulian tradition in these sediments and to document the nature of the rubble and understand its formation. The Astoli nala drains an area of Vindhyan quartzite which outcrops to the north of Astoli. At this location (25°25'36.5" N; 75°34'32.5" E), Trench AST-2-A measuring 2x1.5m was laid out on top of the section exposed by the nala and excavated to the nala bed at a depth of 120cm. 472 artefacts were recovered from this Trench AST-2-B (25°25'35.7" N; 75°34'32.1" E) measuring 2x1.5meter was laid further downstream of the nala, in the bed dug up to a depth of 178cm. About 700 artifacts belonging to Acheulian tradition were recovered from this trench (*IAR* 2006-07: 90).

DATING

The lack of palaeontological evidences from any of the sites precludes the establishment of a relative chronology on the basis of the comparative study of the tools recovered from the different parts of the country. Typologically, there is homogeneity among the tools of the all of the sites. On the basis of the recovered material we can assume that this area was also suitable region for primate man in ancient period. Spatially the Acheulian culture is better known in the eastern part of the Berach basin.

In unit III of Bangar Canal, two small assemblages of artifacts were found at 17.20- and 18.40-meter depths. These assemblages made on quartzite and quartz, include cores, flakes and blades, and in the case of lower horizon, also one specimen each of Chopping tool and scraper. Two uncorrected Th/U dates from the bottom of the dune profile, where these assembles were found, are 131,000 ± 15,000 BP and 390,000 ± 50,000 BP. Even though these assemblages do not contain typical Acheulian artefacts, they have been assigned to the Lower Palaeolithic stage because the overlying deposit has yielded a typical and rich middle palaeolithic industry which is securely dated by three TL dates to around 1,50,000 years. In view of the technologically primitive nature of the Acheulian material from Singi Talav, Chhajoli and a few other sites, Th/U and TL dates mentioned above, and Th/U dates for early Acheulian from Newasa in Maharashtra and Hunsgi-Baichbal valleys in Karnataka, the age of the Acheulian in the Didwana area can be expected to range from 200,000 to 400,000 Years BP (Mishra 2007: 116).

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