CHAPTER IX

COMPARATIVE STUDY OF THE RAJPUTANA STONE AGE CULTURES IN RELATION TO STONE AGE CULTURES IN AND OUTSIDE INDIA
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I

THE LOWER PALAEOLITHIC

IN INDIA

In the Lower Palaeolithic two cultures are distinguished in India. These are (i) The Madrasian or handaxe-cleaver culture; and (ii) The Soanian or pebble tool culture.

The former is known from the whole of peninsular India excepting Malabar, the extreme south, Saurashtra, Sind and Assam, and from the Punjab. It is a mixed Abbevillio-Acheulian complex comprising handaxes, cleavers, flakes, choppers and scrapers. The latter are made both on river-borne pebbles and flakes. Flakes are normally thick, wide-angled, and with prominent bulbs of percussion - Clactonian like - but small thin specimens also occur; besides an undoubted Levallois element is present in several industries albeit in small proportions. The culture on the whole has a monotonous homogeneity all over the country; technologically primitive and evolved tools occur side by side and so far no where adequate stratigraphical evidence has been found for a technological evolution within the culture. The raw material is everywhere predominantly quartzite though in areas such as Northern Deccan where it was not available, lava rocks like olivine dolerite have been used. The stratigraphical horizon of this culture is also remarkably uniform. It occurs in the first gravel deposit of the peninsular rivers. This gravel is dated to the Middle
Pleistocene on the basis of faunal evidence from the Narmada. In the Potwar region of West Pakistan this culture occurs in the first terrace of the Soan which on stratigraphical evidence is dated to the Second Interglacial period.

The pebble tool or Soanian culture was first known from the Potwar region only but in the last few years its extensions have been found in the Eastern Punjab in India. Two divisions are distinguished in it, namely the Early Soan and The Late Soan. Of these two the former belongs to the Second Interglacial period and is typologically Lower Palaeolithic; the latter is of Third Glacial age and is more akin to the Middle Palaeolithic industries of India. The type tools of the Early Soan are unifacial and bifacial choppers and scrapers made on river-borne pebbles of quartzite and trap, and flakes.

With this brief introduction serving as background Rajputana handaxe-cleaver industry will be compared with the industries of those area where systematic work has been done and the lithic industry is known in relation to reliable stratigraphy. The comparison, however, will be mainly typological and the stratigraphical details will be mentioned only when they differ from those of Rajputana.

GUJARAT

Palaeolithic finds from Gujarat had first been made by Robert Bruce Foote in the Sabarmati valley towards the end of the last century. In making the typological comparisons the information collected from published sources has been checked and supplemented by a study of the representative collections of stone implements from most of the areas in India and outside available in the Deccan College Museum.

Later a comprehensive survey of the Sabarmati and its tributary Orsang was made by Sankalia in the early forties of this century. This was followed by a survey of the Mahi by Subbarao. The environmental aspect has been studied by Zeuner in some detail. As a result of all these studies a fairly clear picture of the Lower Palaeolithic of Gujarat is available.

The implements generally occur in the gravel conglomerate but in the Sabarmati some specimens were also collected from the silt. Primitive and advanced specimens occur together and in spite of careful recording of levels from which the various artifacts came no evolutionary trend could be discerned by Sankalia. The industry comprises pebble tools, hand-axes, cleavers and flakes. Unifacial pebble tools are more steeply and in fact crudely worked than Rajputana specimens. They are nearer to Soanian specimens than pebble tools from anywhere else in India. Bifacial pebble tools are not very common and are decidedly inferior to both Gambhiri and Berach specimens. Among the handaxes irregular, uneven and deeply flaked specimens occur alongside symmetrical, thin and smooth almond-shaped pieces and ovates. Some of the specimens made on so granular a material as quartz display very high degree of craftsmanship. These can not be matched by many specimens from Rajputana. The cleavers from Gujarat, however, do not display commensurate skill; there are very few specimens comparable to the cleavers from the Gambhiri made by the side blow technique and having a parallelogram section and those made on prepared core flakes with trapezo-

ideal and parallelogram sections. Large pebble cores like the one illustrated from the Banas (Pl, X Fig. 1) occur in both areas; but whereas in the Gambhiri true Levallois flakes occur the finest specimens from Gujarat can be described only Proto-Levallois.

Malwa

MALWA AND NORTHERN MADHYA PRADESH

Malwa is the fertile region of western Madhya Pradesh and physiographically is a continuation of southern Rajputana.

River Shraya, a tributary of the Chambal, was studied by A.P. Khatri in this area. The palaeolithic industry is characterised by pear-shaped and almond-shaped handaxes, cleavers made mostly on end flakes and pebble tools. Handaxes display bold primary flaking as well as soft cylinder hammer technique. The industry is very similar to that of the Gambhiri.

Recently Rameshwar Singh, a research student at Deccan College has collected a large amount of Lower Palaeolithic material from the valleys of the Betwa and its tributaries in northern Madhya Pradesh and Jhansi district of Uttar Pradesh. The collection includes very few, if any pebble tools but is extremely rich in very fine symmetrical handaxes including ovates made on flakes by soft cylinder hammer technique and thin U shaped cleavers on flakes. The latter are very similar to, and sometimes finer than the Gambhiri specimens made on prepared core flakes. Many handaxes from Rajputana can also be compared with the Betwa valley specimens.


NARMADA VALLEY

As early as 1875 C.A. Hacket of the Geological Survey of India had found an ovate in the ossiferous beds of the Narmada gravels. Later De Terra and Paterson studied the river near Hoshangabad and Narsinghpur. Their stratigraphical and typological observations have become an yardstick for measuring the data from other areas in India. Briefly their observations were as follows: The stratigraphy of the Narmada could be divided into three groups. The first group consisted of a consolidated gravel at the bottom and a thick silt at the top. Both these deposits yielded Middle Pleistocene fauna. In the gravel conglomerate were found large, thick flakes reminiscent of the pre-Soan flakes of the Punjab, Abbevillian to Acheulian handaxes, cleavers and cores, most of them heavily rolled. The silt yielded fresh flakes and Acheulian bifaces. It was covered by gravel and pink clays of the upper group with an erosional unconformity at the base. Both gravel and silt yielded fresh Acheulian bifaces and 'Late Soan' tools besides derived implements of the Lower Group. The third group consisted against of sandy gravel and black soil resting the slopes of the older channels, and yielded an industry which is now recognised to be Middle Palaeolithic.

The departments of Archaeology of the Deccan College, Poona and the Baroda University in their recent work near Maheshwar, 250 miles down stream from Hoshangabad have found a slightly different stratigraphy. Here two terraces are seen on the river at the heights of 80 and 44 feet from the winter season water level. The gravel of the first tert-

ace has yielded a mixed Abbevillian-Acheulian industry and that of the second terrace a Middle Palaeolithic industry.

Coming to a typological comparison of the industries the large 'pre-Soan' flakes from the Narmada are similar to those of Group I from the Gambhiri. One such specimen, DCM 84 can be compared with CEG 75 (Pl, XXI; Fig. 1) Similarly huge pebble cores of the Narmada are represented in the Banas. Some unifacial pebble tools from the Narmada can be compared with pebble tools from the Banas. The illustrations given by De-Terra and Paterson are limited and do not include any Levallois flake or bifacial chopper. However on the basis of their general description it can be said that all the types of the Narmada are present in the Lower Palaeolithic of Rajputana.

At Khandivili near Bombay Todd had found a stratigraphic sequence of five alternating layers of clay and gravel beginning with clay in a section behind the Padan hill. These layers yielded a succession of eight stone age industries encompassing the entire Palaeolithic and Mesolithic. The earliest industry was one of 'rough tools' and Clactonian flakes in the Lower clay. This was followed on top of the clay by a somewhat similar industry of scrapers, choppers, cores and one rostrocarinate. The overlying gravel yielded Abbevillian and Clactonian specimens. On top of the

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1. This brief note on the stratigraphy of the Narmada at Maheshwar has been written in consultation with Dr. H.D. Sahkalia. A detailed study of the Narmada lithic industries is expected to be published soon.
2. DCM : Deccan College Museum.
gravel Clactonian flakes were found in association with late Acheulian handaxes and flake tools. In the succeeding Middle a blade industry together with scrapers, cores and small handaxes was found. The succeeding layers yielded two blade and burin industries and one microlithic industry. In another section facing the one just described a laterised gravel corresponding to the Middle clay of the previous section Acheulian handaxes and flake tools were found.

This complex stratigraphical and cultural sequence has been described in full as it has often been mentioned as an unique sequent illustrating the development of the Indian stone age industries. Subsequent search by several workers independent of each other has, however, failed to confirm Todd's observations. B.B. Lal in an examination of Todd's sections found that all the deposits found by Todd were not in situ; some of them were due to redeposition. Malik in an exploration of the Bombay area did not find any evidence for Todd's Clactonian and Acheulian industries though he confirmed the stratigraphy given by Todd. Recently in December, 1960 Dr. Sankalia, Dr. Mahopatra and I carried out a thorough exploration of almost all the sites discovered by Todd. Two important sites namely Khandivli and Borivli were also visited by Prof. Zeuner during the same period. An examination of the nalla sections behind the Padan hill at Khandivli revealed only one gravel deposit of about 6 feet thickness covered by a 2-4 feet layer of silt. There was little basis for subdivision of this gravel. It is possible that two terraces exist in this area but this requires a detailed study of the levels of various sec-

sections. The tools from all the sections, however, reveal a homogeneous industry which is akin to the Middle Palaeolithic industries of other areas in the country. Characteristic Lower Palaeolithic tools are completely absent.

In this context it might also be mentioned that even in Todd's illustrations typical Acheulian forms are completely missing. However, Mr. Issac has recently informed Dr. H.D. Sankalia that there are genuine Acheulian specimens in the British Museum from Khandivli. At any rate the evidence in the field for Lower Palaeolithic is non-existent and that published quite inadequate.

**GODAVARI-PRAYARA VALLEYS**

Lower Palaeolithic tools from the Godavari were first collected by Sankalia in 1951-52 from the trenches cut for a dam on the river near Gangwadi, 10 miles west of Nasik and some 20 miles below the source of the river. The tools were much rolled and weathered. The assemblage in its final outcome constitutes a handaxe-cleaver industry but basically it is a flake industry in the sense that a great majority of tools are made on flakes. Flakes generally have Clactonian features and can be compared with many specimens from the Banas and the Gambhiri. The cleavers, though they show a variety of forms are generally inferior to Rajputana specimens. A special feature of this assemblage is the presence of a number of side scrapers made on flakes and having a straight working edge and a thick worked back. These can be compared with flake scrapers from the Gambhiri.

Recently a new site has been found by Sankalia on the Godavari near

Gangapur. Some implements from this site have been published. \(^1\) I was able to visit the site in \(^{\text{december last}}\) this year with Dr. Sankalia and Prof. Zeuner. The implementiferous gravel layer is composed of fine gravel and coarse sand overlying a clay or silt deposit. The implements occur in abundance and are completely fresh, virtually in a mint condition. The reason for this is that a little away from the implementiferous layer a large dolerite dyke is exposed which supplied the raw material for the industry. The assemblage consists of fine, slender prepared core flakes and cleavers made on them, almost to the complete exclusion of crude forms. The cleavers bear a close affinity to the specimens made on prepared core flakes from the Garabhiri. The advanced character of the industry is perhaps due its comparatively late date which is indicated by its stratigraphy.

Not far from Nasik southward on the Pravara Sankalia has discovered a unique section on the Pravara which yields evidence of human habitation in the area from Lower Palaeolithic to Muslim period. \(^2\) The lowest specimen has yielded a typical Madrasian industry in association with Bos Namadicus Falconer. Unlike in the Godavari section the tools here occur in limited numbers but a fairly large collection has been built up by persistent collecting over a number of years. Handaxes are generally thick, irregular and marked by deep flake scars; however some evolved specimens including one very fine pyriform handaxe also occur. Cleavers are made on side

1. T.A.R., 1959-60., p. 30., Fig. 11.


as well as end flakes and have a variety of forms. A special feature of the industry is the presence of a number of discoidal pieces which were probably used as hammerstones.

The proportion of handaxes from Rajputana comparable to those of Nevasa is not very large as many of the pieces from the former region are made on flakes and worked by cylinder hammer technique; they are superior to most of the specimens from Nevasa. The fine pyriform handaxe from Nevasa may be compared in workmanship with CHG 96 (Pl. XIX; Fig. 1; 1.).

The cleavers made by side blow technique and having parallelogram section are common to both areas. In the flakes no Levallois specimens are reported from Nevasa. Pebble tools are scarce at Nevasa but a few steeply worked unifacial specimens are similar to those of the Banas.

MALAPRABHA BASIN

Malaprabha, a tributary of the Krishna had already yielded palaeoliths to Bruce Foote in the last century. A systematic survey of the river has recently been done by R.V. Joshi. The river is extremely rich in palaeoliths. The raw material is fine-grained quartzite of various hues. The industry primarily consists of handaxes, cleavers, flakes with a very small proportion of pebble tools. Most of the specimens are made by Acheulian cylinder hammer technique and the proportion of well-made specimens to crude ones is very large. The late Dr. Van Riet Lowe after seeing a representative collection described the industry as Upper Indian Acheulian. The

1. Sankalia, H.D. (1956) op. cit.  Fig. 4, b., p. 41.
handaxes include very fine almond shapes, ovates and cordates. Cleavers are usually U or V shaped and some have hollowed or splayed edge. Majority of the specimens are made on flakes. Rajputana industry has virtually no cordates and ovates are also not very common but other forms from the Malaprabha can be technologically matched by specimens from Rajputana. The cleavers from the Gambhiri may be regarded slightly superior to Malaprabha specimens. Though the collection from the Malaprabha is said to include cleavers with parallelogram section, no typical examples are illustrated. The bifacial tools from the Gambhiri are certainly more advanced than the specimens from the Malaprabha.

A Palaeolithic industry has been described by Seshadari from Kibbanhalli in district Bangalore. It is characterised by rostocarinated, abbevilléan to early Acheulian handaxes, U and V shaped cleavers, choppers, chopping tools, beaked implements, side and hollow scrapers, points, and blades. The presence of the last three forms suggests that this is probably a mixed assemblage and hence can not be compared to Rajputana material.

MADRAS REGION

The first palaeolith in India was found near Madras by Bruce Foote in 1863. More implements were collected by him later from this region. The Yale-Cambridge expedition studied two localities namely Vadamaduarai and Attirampakkam on the Kortalyar (old Palar) river. At Vadamaduarai tools

2. Bruce Foote, R. op. cit. p. V.
were collected from three horizons namely, (i) Boulder conglomerate, (ii) Laterite, and (iii) post-laterite horizon. The implements comprised hand-axes, flakes and cores almost to the complete exclusion of pebble tools and cleavers. A classification based primarily on the state of preservation of the tools revealed three typological stages comparable to Abbevillean-Early Acheulian, Middle Acheulian, and Late Acheulian. At Attirampakkam the tools came from the terrace 2 of the Kortalyar and corresponded generally to those of stage III of the Yadamaduarai. Cleavers were numerous and made on flakes; they included specimens made by the Vaal river technique and having parallelogram section. De Terra and Paterson have given very few illustrations but a number of specimens have been illustrated by Krishnaswami. The fine ovates and cordates are an advance over the industry of Rajputana but the close affinity between the two areas lies in the presence of cleavers made by the Vaal technique and having parallelogram section. No pebble tools or genuine Levallois flake remains have been illustrated by Krishnaswami.

KURNOOL

As early as 1930 Cammiade and Burkitt had worked out a general outline of stone age industries and corresponding climatic phases of Kurnool. The Prehistoric Expedition of 1949 led by Prof. Zeuner also visited a few localities near Giddalur and recently the entire district has been extensively investigated.

extensively explored by N.Issac. A significant feature of the Kurnool industry is the large proportion of pebble tools, nearly 40% of the entire collection. Issac has divided his collection into three technological stages which roughly correspond to Abbevillian, Early-Middle Acheulian, and Late Acheulian. Among the handaxes fine ovates and tiny almond-shaped pieces occur besides bigger almond-shaped and pear-shaped examples. The tiny pieces can be compared with similar examples from the Banas and the Berach. Cleavers made by Vall technique occur in both areas. Bifacial pebble tools with alternatent flaking are also common to both the regions but Issac does not mention the presence of Levallois flakes in the Kurnool collection.

ORISSA

The occurrence of palaeoliths from Orissa was first reported by V.Ball as early as 1875. This was followed by the work of Bose and Sen in Mayurbhanj. Recently Mahopatra has carried out a detailed survey of the Mahanadi, Brahmani, and the Baitarni in the northern half of Orissa and he has brought to light a number of Lower Palaeolithic sites in all these rivers. The Kuliana industry described by Bose and Sen was mainly


characterised by Abbevillean and Early Acheulian handaxes. Mahopatra's findings, however, include truly Upper Acheulian bifaces, thin ovates and almond shapes worked by cylinder hammer technique. There is no evidence of the Levallois technique. Among the handaxes all the types from Orissa can be found in Rajputana but cleavers from the latter region are an advance over those of Orissa. Bifacial pebble tools from the Gambhiri are also not matched by Orissan specimens. Another superior feature of the Rajputana industry is the presence of Levallois flakes.

**SINGRAULI BASIN**

An extremely rich palaeolithic locality was found by J. Cockburn in the eighties of the last century in the Balia Nadi and Bichi Nala, tributaries of the Rihand river in the Singrauli basin of district Mirzapur in southern Uttar Pradesh. The Prehistoric Expedition led by Prof. Zeuner explored the area in 1949; the results of the Expedition's work have been published by Krishnaswami and Sounderrajan. The industry found here is similar to that of Rajputana both in its stratigraphical horizon and typological details. The handaxes are generally elongated pear-shaped but fine ovates also occur. Cleavers are U and V shaped and are made both on side and end flakes. Pebble tools which constitute 15% of the assemblage are both unifacial and bifacial; among the flakes there are some Levallois specimens as well as a few blade-like specimens. All these types occur in

POTWAR REGION

The occurrence of palaeoliths in the Soan valley in the potwar region of Western Pakistan had been pointed out by D.N. Wadia in 1928. Later De Terra and Paterson undertook an extensive geological and archaeological study of this region and the results of their work have formed the basis of all research work in the country. They recognised the existence of three Lower Palaeolithic cultures in the Punjab. These were: (i) Pre-Soan, (ii) Early Soan, and (iii) Madrasian.

The Pre-Soan occurs in the Boulder Conglomerate deposit of Second Glacial age. Typologically it comprises large, thick, wide angled flakes recalling the Cromerian of England and is completely unrelated to the succeeding Early Soan. Lately the artifactual character of these flakes has been questioned by Oakley. However such flakes are really human, they may be compared with specimens like CHG 75 (Pl.XXl.Fig.1) from the Gambhiri.

The Early Soan belongs to terrace 1 of the Soan and is dated to the Second Interglacial age. Its type tools are unifacial and bifacial scrapers and choppers made on flat-based and rounded pebbles. The accompanying flakes are thick and wide angled like the Clactonian specimens. Some of the unifacial pebble tools may be compared to specimens from the Banas but on the whole the Soan specimens are more steeply worked.

than those from the Banas. Secondly though Movius classifies the Soanian as a chopper-chopping tool culture, the specimens which can be truly called *chopping tools* as defined by Movius are not many and those illustrated do not attain the fine sinus edge of the Gambhiri specimens. Besides the flakes from Rajputana include *proto-Levallois* and some genuine Levallois specimens whereas those of the Soanian are predominantly Clactonian.

Along with pebble chopper-chopping tool culture the peninsular handaxe-cleaver culture also occurs in the Soan valley at four sites, the most important of which is Chauntra. The earliest handaxes are of the Abbevillian type and are of the same age as the Early Soanian, namely Second Interglacial. In the terrace 3 deposit of Third Glacial age derived Abbevillian specimens occur along with fresh Acheulian handaxes and rolled cleavers. And at least at one site namely Adial Early Soanian tools were found in association with an Abbevillian handaxe. The handaxes are of elongated pointed or ovate type and may be compared with Group II specimens from the Gambhiri.

**NORTH EAST PUNJAB**

The Soanian culture was formerly confined only to the West Punjab but in recent years its extensions have been found in the East Punjab as well. Dharmi Sen in an exploration of the Sirsa, a tributary of the Sutlej found three terraces the upper two of which were implentiferous.


The artifacts included pebble scrapers and choppers, cores, flakes and at least one proto-handaxe worked on one face only. This last (Fig. 4 No.) is similar to MEP (Pl. X1 Fig. 1) from the Banas. The terraces have so far not been correlated with glacial deposits.

B.B. Lal has found a sequence of five terraces on the Banganga, a tributary of the Beas. The first three of these have yielded implements which include unifacial and bifacial choppers, scrapers, cores, flakes and two pebble handaxes. Similar tools were found on the Beas also but no terraces were observed here. The pebble tools are mostly steeply and crudely worked than the Banas specimens. The bifacial specimens do not exhibit alternate flaking and are considerably inferior to Gambhiri specimens. One specimen from Guler illustrated by Lal (Fig. 4 No. 1) may be compared with (Pl. X1 Fig. 1). The so-called pebble handaxes are no more than crude triangular pebble tools.

Finally it may be considered as to what is the relationship between the Soanian pebble tools and the Madrasian handaxes in Rajputana. De Terra and Paterson in their work on the Narmada noted the occurrence of Soan type pebble tools and Narmada handaxes and flakes along with handaxes and cleavers in the Lower Group and Upper Groups of the Narmada at Hoshangabad and Narsinghpur. They found an evolutionary trend in these tool types parallel to that in the Soan valley and consistent with the development of the handaxes and cleavers in the Narmada. They designated

1. Ibid., p. 182.
2. Lal, B.B. (1956) "Palaeoliths from the Beas and Banganga valleys",
the various Soanian tool types as 'Pre-Soan', 'Early Soan' and 'Late Soan'
and adopted the evolution of the Soanian tool types as the basis for
dating the Narmada industries. Thus De Terra and Paterson implied an inde-
dependent occurrence of the Soan and Madras industries in the Narmada.
Since then the co-occurrence of pebble tools and handaxes and cleavers at any
site has been regarded as evidence for a meeting of the Madrasian and
Soanian cultures. Krishnaswami found such a meeting ground and he and
Sounderrajan found it in the Singrauli basin of Mirzapur. The result is
that now almost every Lower Palaeolithic site in India is such a meeting
ground. This theory has been taken to be specially applicable to Rajputana
because of Rajputana's geographical position in between the areas of Soanian and Madrasian cultures.

Pebble tools in fact are now known to occur all over
India in association with handaxes and cleavers. Wheeler's recent obser-
vation that their southernmost limit is Mayurbhanj in Orissa does not cor-
rectly state the position. Pebble tools have been known to occur as far
south as Nellore for about twenty years and since then they have been found
in Kurnool, Karnataka and the Northern Deccan. Nor does Lal's thesis that

2. Krishnaswami and Sounderrajan, op. cit. p. 47.
Tools With Topographical and other Notes. M.A.S.I., No. 58, p. 3-14.
6. Sounderrajan, K.V. (1952) op. cit. p. 73.
7. Joshi, R.V. (1955) op. cit. p. 64.
their proportion grows thinner as we move south seem to be correct for recently Mr. Issac on the basis of a study of more than three thousand artifacts has shown that the pebble tools constitute more than 40% of the entire collection in Kurnool.\(^1\)

The occurrence and proportion of pebble tools in fact seems to be closely related to the availability of suitable pebbles as raw material. They are rare though not quite absent in the Godavari - Pravara valleys because the raw material here was primarily obtained from dolerite dykes and only rarely from river borne pebbles. In Rajputana itself pebble tools are more common in the Banas than in the Gambhir and the Berach probably because the former contains an enormous supply of river borne pebbles of all shapes and sizes whereas in the latter they are limited. Most of the pebble tools are quite unspecialized - technologically and functionally - and their form is almost fully determined by the type of pebbles employed for making them. They would in fact seem to be obvious forms to a prehistoric artificer working from river borne pebbles.

Thirdly it is not always to separate the typical pebble tools from the hand-axes and cleavers for between the straight-edged chopper or scraper and the handaxe several transitional forms occur which defy segregation. For all these reasons the explanation for the presence of pebble tools in a Madrasian assemblage seems to be that they are an integral part of the handaxe-cleaver industry rather than a foreign element. The whole question requires a re-examination as Sankalia has suggested.\(^2\)


2. Pt. Bhagwanal Indraji Memorial Lectures delivered at the University of Bombay in December, 1960 and shortly to be published by the University.
The Lower Palaeolithic of South East Asia is characterised by a culture complex which is completely distinct from the handaxe-cleaver complex of the rest of Asia, Europe and Africa. Movius has given it the name chopper-chopping tool complex. It includes the Early Azyathian of Burma, the Choukoutienian of China, the Patjitanian of Java and the Tampanian of Malaya besides the Early Soanian of north west India (now West Pakistan). This culture complex is distinguished as much by the absence of certain traits as by the presence of others. According to Movius its three main features are the following.

(i) Presence of unifacial (choppers/scrapers) and bifacial (chopping tools) choppers and scrapers, flakes, cores and/or handadzes and proto-handaxes;

(ii) Absence of handaxes; and

(iii) Absence of Levallois technique.

It is true that handaxes occur in the Patjitanian of Java and the Tampanian of Malaya but these according to Movius are easily distinguished from the Acheulian coup-de-poing in that the majority of them are really pointed bifacial choppers with longitudinal flaking rather than the classic Western form. He therefore regards them as due to independent development rather than to outside influence. In any case where such handaxes occur they form an insignificant part of the total assemblage. Paterson's suggestion that these cultures belong to the Clactonian family can


2. Ibid., p. 101.

Recently handaxes have also been reported from Japan. See, Sherizawa, Chosuke and Ikawa, Fumiko (1958) "The Oldest Archaeological Materials from Japan" Asian Perspectives. Vol. II., No. 2. pp. 1-39. Pls. I-II.
not be upheld because all these cultures are essentially core cultures where as the Clactonian is essentially a flake culture.

Movius has taken pains to correlate the Pleistocene stratigraphy of all these areas and he finds that there is a remarkable similarity in this respect. However, Zeuner has drawn attention to the pitfalls inherent in such a long range correlation. The cultural sequence in the Soan valley, Burma and China starts at the beginning of the Middle Pleistocene and in Java slightly later toward the end of the Middle Pleistocene.

Though individual similarities between choppers and chopping tools from Rajputana and South East Asia can be easily found out, essentially the Palaeolithic culture of Rajputana belongs to the Classic Western tradition. Its main components are handaxes and cleavers (mostly made on flakes) and flakes including the Levallois type rather than core tools.

**WESTERN ASIA**

Adequate evidence for Palaeolithic succession in Western Asia is known only from the Levant. Here the earliest finds are of a flake industry without handaxes and without Levallois technique. It is dated to the end of the Second Interglacial or beginning of the Third Glacial. Howell has given it the name Tabunian after the cave of et-Tabun on Mount Carmel. It is similar to the Tayacian of Europe. There is little similarity

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between it and the Rajputana industry.

But for a few undated finds there is very little evidence in Western Asia for an Early Acheulian culture. The cultural sequence over most of the region starts with Late or Final Acheulian and more frequently with Mousterian. A Late Acheulian industry was found immediately overlying the Tabunian in the cave of Oumm Qatafa in the Judean desert. It includes ovate and lanceolate form handaxes, points, side-scrapers and Levallois flakes. Larger assemblages of Late and Final Acheulian are known from et-Tabun and Oumm Qatafa and are dated to the Last Interpluvial age. In the et-Tabun assemblage from level F handaxes formed one third of the total yield and were mostly pear-shaped. Other tools were side scrapers, rough burins, choppers and discs. Oumm Qatafa assemblage from level D2 was similar to that of et-Tabun. Both had very little Levallois influence.

A rich Acheulian assemblage was found in the level E of et-Tabun. This was originally designated Acheulian-Mousterian and later Micoquian by Garrod but Howell has given it the name Final Acheulian. This assemblage was characterised by very abundant handaxes, including Micoque types; still more abundant were side scrapers. Other types included angular steep, and end scrapers, points, burins, choppers, Chatelperron and Adui points and flakes and blades with nibbled retouch. But for the presence of a few Levallois points the flake technique was essentially non-Levallois. The range of tool types suggests that Garrod's original term 'Acheulian-Mousterian' describes the industry more aptly.

1. Ibid, p. 16.
3. Howell, Clark, F. op.cit p. 16.
According to Braidwood evolved handaxes frequently occur as surface finds in the southern flanks of the Zagros mountains in Iran.¹

Both from the descriptions and illustrations it is evidently clear, that the handaxes occurring in the Late and Final Acheulian of Western Asia are more akin to those occurring in the Middle Palaeolithic of Western Rajputana than to the specimens of the Lower Palaeolithic culture.

**EUROPE**

In the Lower Palaeolithic of Europe two cultural traditions are distinguished; (i) A handaxe tradition; and (ii) a flake tradition.

The distribution of handaxes is confined to "a single geographically unified territory extending from southern Britain and the Ardennes to the Pyrenees." Outside this area a few specimens have been found in Northern Germany at sites like Markkleeeberg in a different cultural milieu and a fairly large number of finds - some geologically dated - have been made in Italy. The former may be attributed to occasional settlements from the handaxe zone and the latter can with certainty be explained as due to diffusion from the west through French Riviera. ³

In central and eastern Europe so far no genuine specimens have been found. Zeuner has suggested that this may be due to the sites having got covered by the Younger Loess. ⁴

3. Ibid., p. 173.
The earliest handaxes from Abbeville on the Somme are regarded to be of First Interglacial age. Though Zeuner says Breuil's dating of the Abbeville is quite sound, the date has not been universally accepted. In the succeeding Acheulian at least seven stages have been recognized, the first five of which belong to the Second Interglacial and the remaining two to the Third Interglacial. Besides handaxes, flake tools, mostly side and end scrapers also occur in the Acheulian industries and the Levallois technique also makes its first appearance in the Acheulian. The cleavers are, however, rare in the European Acheulian.

In Rajputana no stratigraphical division can be made between the Abbevillean and the Acheulian but the Abbevillean element can be seen in such specimens as the Group II from the Gambhiri. Similarly in the Acheulian though typological groups may be made on technological criteria, these can not be verified by stratigraphy. Otherwise all the types of the Acheulian occur in Rajputana. Flake tools also occur but they are not very specialized and flakes of both simple and Levallois type are found. Finally in Rajputana cleavers form an important component of the industry.

Clactonian flake industries unassociated with handaxes occur in south-east Britain at Swanscombe in Kent and Clacton-on-Sea in Essex and at a number of sites in Northern Germany, the two important being

1. Zeuner, (1952) op. cit. p. 167;
2. See for instance, Oakley, K.P. (1957) op. cit., p. 203; and
Oberwerchen near Hanover and Markkleeberg near Leipzig. The flakes are thin, thick, wide angled and detached from unprepared cores. They are as MacBurney has pointed out in general similar to those occurring with handaxes except that in the former they occur in greater abundance and concentration. The greater majority of flakes occurring in Rajputana are similar to these Clactonian flakes.

NORTH AFRICA

The earliest human artifacts in North Africa occur at a locality known as Ain Hanech near St. Arnaud in Algeria in association with a supposedly Villafranchian fauna. The artifacts consist of Clactonian-like cores made of polyhedral limestone nodules. The industry is as yet imperfectly known and obviously bears no similarity to anything from Rajputana.

Several other localities of Early Middle Pleistocene age are also known from North Africa. Among these are Lake Karar and Palikao spring deposits in Oran province and Sidi Zin water hole deposits in Northern Tunisia. Lake Karar deposits have yielded Acheulian handaxes including finished elongated lanceolate shapes and heart shaped specimens and D shape cleavers. Flake tools include small points and side scrapers. D shaped cleavers are similar to those occurring in Olduvai bed III. Though Karar tools are older than those of Rajputana, they can be typologically compared with the latter. Finds from Palikao are similar to those of Lake Karar but with the qualification that here they occur in association with a primitive human type known as Atlantropus. At Sidi Zin four cultural layers occurred in a deposit which is faunistically homogeneous. The lowest layer yielded

fine lanceolate handaxes which are more beautiful than those of Lake Karap. and pebble choppers and scrapers. In the second layer handaxes were mostly elliptical and often unifacial; besides carefully prepared cleavers also occurred. Finds in layer III were similar to those in layer I. The layer IV was marked by a decrease in handaxes and the appearance of the prepared core technique. Handaxes and cleavers can be compared only with the most symmetrical specimens from Rajputana. A common feature between the two industries is the presence of unifacial handaxes made on flakes. Pebble tools are not illustrated by MacBurney and hence can not be compared.

In Morocco near Casablanca an important archaeological sequence has been found in a cutting in the marine beach deposits known as the Sidi Abderrahman quarry. The archaeological finds are closely related with palaeontological and sea level data. At the base here occurs an archaic handaxe industry comprising elongated, pear shaped and irregular handaxes as well as U shaped cleavers. It is associated with a sea level of First Interglacial or Mindel Interstadial date. The second industry occurs in a deposit linked with 30 m. high sea level of the Second Interglacial. It includes handaxes of pear shaped to cordiform outline mostly finished with a soft hammer technique together with U shaped cleavers made on large flakes. The third industry, probably of Third Glacial age comprises highly evolved handaxes of cordiform to oval outline. MacBurney has illustrated types specimens only from the basal Sidi Abderrahman but all the specimens mentioned by him occur in Rajputana, the only exception being the cordates.

The Rajputana industry on the present evidence is not older than the industry of the 30 m. sea level from Morocco.

In Egypt the geological and archaeological history of the Nile valley has been studied by Sandford and Arkell with a remarkable completeness, and the results of these studies are presented in a series of excellently published reports.

The earliest human artifacts appear in the deposits whose upper margins lie at 24-27 meter above alluvium. These formations have yielded a large variety of handaxes, cores and flakes in situ. Handaxes include most primitive to highly advanced specimens. And though in Lower Egypt there is some indication that the more primitive tools may be derived from some earlier deposits, in Upper Egypt and Nubia the primitive and evolved tools are certainly contemporary. According to McBurney the only sea level with which these deposits can be correlated is the 30 M. level of the Second Interglacial age.

A number of handaxes from the Banas and those of Group I from the Gambhiri can be compared with the irregular Chellean specimens illustrated by Sandford and Arkell from the 100 Ft. terrace of the Nile in Nubia and Upper Egypt. The Acheulian specimens can be matched by many specimens from Rajputana. The tiny handaxes from Egypt are similar to those of the Banas and the Berach.

EAST AFRICA

The earliest artifacts in East Africa belong to the Kafuan culture the first phase of which occurs in the Ironstone band of

the 270 ft. terrace of the Kagera in Uganda. This terrace was considered by Van Riet Lowe to be of Pliocene age.\(^1\) Developed stages of the Kafuan occur in the 200 ft. terrace and in the basal boulder bed of the 100 ft. terrace. Kafuan tools have often been regarded as the earliest handiwork of man. The tools themselves consist of split pebbles of various shapes and worked only along one edge in one direction only. The artifactual character of most of the Kafuan specimens is not universally accepted.\(^2\) This has recently been questioned by Oakley.\(^3\) Apart from the most rudimentary character of flaking on them one of the reasons for Oakley's doubts is the extreme prodigality of these tools. Recently M. Posnansky who has first-hand acquaintance with the material in the field has stated that the Kafuan tools may quite easily be the products of nature. Hardly any specimens from Rajputana can be compared with the Kafuan specimens for even the simplest specimens among the former bear unquestionable evidence of human work.

The succeeding cultural stage is represented from the Olduvai Gorge deposits which offer the most complete evolution of Handaxe culture anywhere in the world. Four deposits are distinguished in this Gorge. Beds I and II belong to the Kamasian pluvial, bed III to Second Interpluvial and bed IV to Kanjeran or Third Pluvial. The earliest culture is Oldowan which occurs in bed I. The characteristic tool type of this culture is a crude chopper worked bifacially along one side of a pebble or other lump of stone.

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and having an irregular, jagged cutting edge. Besides a small number of tools made on flat-based pebbles and worked in one direction also occur. Both these types are represented in Rajputana, the only difference being that here they occur in association with handaxes whereas in East Africa they belong to a pre-handaxe horizon. The similarity between one pebble tool from Uganda and one from the Banas has already been pointed out (See page 103). It might be added that from Leakey’s illustrations the bifacial pebble tools from the Olduvai Gorge appear to be inferior to those of the Gambhiri.

The next three deposits in the Olduvai reveal the development of handaxe culture from stage I to II. In the lower part of bed II, pointed pebble tools appear which Leakey regards as the earliest specimens of the handaxes. In the next stage large, thick handaxes with massive butts occur; these are of rostrocarinate type. The third stage is represented by large and thick but more or less triangular handaxes but sometimes oval specimens with lower face remarkably flat. The specimens of these three stages which together constitute the Chellian stage of the handaxe culture at Olduvai can be compared with pebble handaxes from the Banas and those of group I from the Gambhiri.

Stages 4 and 5 are transitional between Chellian and Acheulian and come respectively from the upper part of bed II and the junction of bed II and III. In stage 4 the handaxes are flaked all round in stead of only along the anterior end in stage 5 the cylinder hammer technique makes its appearance. The fully flakes handaxes of group I from the Banas show these characteristics. Stage 6 occurs in Bed III. The cleaver

1. Leakey, L.S.B. (1951) Olduvai Gorge, p. 34.
first makes its appearance here, and the cylinder hammer technique registers further improvement. The stages 7 to 11 come from bed IV. The stage 7 is distinguished by broad handaxes and cleavers which are narrower at their working edge than in the centre. Stage VIII is represents an intrusive phase at Olduvai and is distinguished by a decrease in the size of the implements, appearance of S twist ovates and V shaped cleavers. The latter occur in the Gambhiri and so do ovates (an extremely fine ovate from the Gambhiri is in S.R.Rao's collection at Baroda; see page 37). But S twist is not common in Rajputana industry. Stage 9 is generally similar to stage 7 and is characterised by a great variety of size. This last feature is also typical of Rajputana. Stage 10 is marked by fine ovates of small to big size made by wood hammer technique, and rectangular cleavers. CHG 86 (Pl. XIX; Fig. 1; I) belonging to group III of the Gambhiri as also the fine ovate in Rao's collection may be compared with the specimens of this stage. It is difficult to study the details of technique from Leakey's photographs probably because of the nature of the raw material. But on the basis of their general appearance two specimens of this stage may be compared with two specimens from Rajputana; CHG—Berach 14 (Pl. XXX; Fig. 2) with specimen 86 (Pl. 35) of Olduvai Gorge and the ovate from Rao's collection with specimen 83 (Pl. 32) of Olduvai Gorge.

In stage 11 handaxes are small and degenerate though fine forms also occur. In their flatness of outline they strongly recall the Fauresmith culture. The illustrated specimens have their counterparts in Rajputana.

In brief nearly all the tool types of Olduvai are present in Rajputana though here no evolutionary development has been observed.
An important Acheulian site occurs in the M-N horizon of the 100 ft. terrace of the Kagera at Nsongezi in Uganda. The assemblage is characterised by handaxes, cleavers, rough cores, flakes and some Sangoan tools. Among the handaxes there are several a number of small elongated forms which offer a close parallel to specimens from the Gambhiri having similar characteristics (Pl. XIX, Fig. 1). Among the cleavers those made by the side blow technique and having a parallelogram section and transverse bear a close similarity to specimens from the Gambhiri; see Pls. XI and XIX of Van Riet Lowe’s book and Pls. XXV and XXVI from the Gambhiri. A prepared core flake from the N horizon is almost identical with OCG 28 (Pls. XXV, XXVI), except that the former is slightly worked on the lower face.

SOUTH AFRICA

The development of the Lower Palaeolithic in South Africa is much similar to that in East Africa. Here the Pleistocene sequence of the Vaal river has been worked out in great detail. No undoubted artifacts are found in the basal older gravels laid down during the Kageran times but in the succeeding older gravels of the Kamasian period developed Kafuan and Oldowan tools occur in gravel terraces ranging from 300 feet to 50 ft. above the stream. A younger terrace at 50 feet contains Abbevillian handaxes made from pebbles together with primitive flakes. This stage is known as Stellenbosch I. No human evidence has been found dating to the dry Kamasian-Kanjeran Interpluvial. A new series of gravels known as the

1. Lowe, C. van Riet (1952) op. cit.
2. Ibid., Pl. XXI, Fig. 1.
Younger Gravels were laid down in the Kajreran times. Three terraces are recognized in these gravels. The main development of the South African handaxe culture, Stellenbosch II-V takes place in these gravels. In stage II the transition from Abbevillian to Acheulian takes place. Handaxes and cleavers are better made than in stage I. In stage III handaxes are more refined, cleavers are made by side-blown technique and have parallelogram section and the Levallois technique appears for the first time. In this stage polyhedral handaxes similar to those of Ologessalile also occur in groups of twos and threes. In stage IV the cleavers are made on end-struck flakes and have a trapezoidal section. Handaxes are comparable to the Late Acheulian of Europe. Levallois technique registers further improvement. In stage V the handaxes are similar to those of the Micoquian of Europe; cleavers have flaring edges and a variety of tools made on the Levallois flakes also occur. The close affinity between South African and Indian handaxe cultures has long been recognized. Van Riet Lowe commenting on this subject wrote; "... an entire assemblage of the artifacts of the Old Stone Age from Madras is indistinguishable from one of Stellenbosch". The same may be said of Rajputana. Nearly all the tool types illustrated by Van Riet Lowe are present in Rajputana. The most striking similarity lies in the cleavers made on side blow flakes and having parallelogram sections.


II

THE MIDDLE PALEOLITHIC

In Chapter V during the discussion on terminology the principal characteristic features of the Middle Palaeolithic culture have been pointed out. They might be briefly summarized here at the risk of slight repetition. The Middle Palaeolithic is essentially a flake culture. The proportion of flakes in a given assemblage may be as much as seventy percent or even more. Most of the retouched tools are also made out of flakes. Among the flakes a definite Levallois element is present, though in what proportion, it has not as yet been assessed for any assemblage other than that of Rajputana. The correct appreciation of this trait has been distorted primarily because of the reasons mentioned in the appendix. Cores are mostly of the discoidal or atypical variety. Among the retouched pieces the largest proportion is that of side and other types of scrapers and points. Borers and a composite tool called borer-scraper occur almost as frequently. In some of the assemblages evolved handaxes and tools obviously derived from them, such as bifacial points of triangular or leaf shape also occur. Besides some assemblages also include advanced forms of the pebble scrapers and choppers of the Lower Palaeolithic type.

There is a distinct change from the Lower Palaeolithic in the choice of the raw material by the Middle Palaeolithic folk. Whereas in the handaxe-cleaver industries relatively coarse-grained rocks such as quartzite and trap were employed, in the Middle Palaeolithic siliceous minerals like chert, jasper, chalcedony, agate and flint have been used almost universally. Only in exceptional cases such as Kurnool, the older
raw material continues.

Stratigraphically this culture belongs to the gravel of the second aggradation phase of the peninsular rivers. This evidence is clearly seen in the Pravara valley at Nevasa and a number of other sites, and in several rivers in Kurnool, Orissa and Malwa. In the Godavari and Narmada Middle Palaeolithic industries have been found in association with Bos Namadicus Falconer which also occurs with the handaxe-cleaver industry of the earlier gravel phase in the Pravara and the Narmada.

Since stratigraphically the two gravels are separated by a thick silt deposit, stratigraphically the Middle Palaeolithic is definitely much later than the Lower Palaeolithic. This fauna has been taken to be a late survival and the culture Middle Palaeolithic culture assigned to Upper Pleistocene.

Regarding the origins of the Middle Palaeolithic culture it might be said that in some areas at least, it has clearly developed out of the preceding Lower Palaeolithic Culture. In the Potwar region, in Rajputana, as northern Madhya Pradesh, some central Indian sites and Kurnool several traits of the earlier pebble tool or handaxe-cleaver culture survive in the local Middle Palaeolithic industry. Among these traits are evolved diminutive handaxes, cleavers and pebble scrapers and choppers. The stratigraphical gap indicated by the silt phase does not necessarily imply a cultural discontinuity in every area. A plausible explanation for the gap in cultural continuity denoted by the sterile silt phase seems to be, as Zeuner has suggested, that during the dry phase succeeding the gravel of the handaxe-cleaver horizon man had moved into the interior

2. Zeuner, (1950) op. cit., p. 11.
away from the river banks and continued to practice his old technology with such modification in it as were forced upon him by the environment.

The deliberate search for Middle Palaeolithic industries is of recent origin. Though industries which may now be assigned to this phase have been known to occur in the Punjab, Narmada valley, Bombay and Kurnool for a long time, their full significance came to be recognized only after Sankalia's discovery at Nevasa on the Pravara. Since then every year new sites are being added from different parts of the country. The distribution of the Middle Palaeolithic more or less coincides with that of the Lower Palaeolithic, the only major exception being North Gujarat. Here also Sounderrajan claims to have found Middle Palaeolithic tools near Kapadvanj where two terraces are reported to occur. However from the illustrations most of the artifacts appear to be microliths.

With these introductory remarks the Middle Palaeolithic culture of Rajputana is viewed in relation to evidence from individual areas.

THE PUNJAB

In the Potwar the Early Soan develops into the Late Soan in the Third Glacial period. The Late Soan though typologically similar to the Early Soan is technologically considerably more advanced than the former and can be grouped with Middle Palaeolithic industries. In it flakes and flake tools outnumber core tools and flakes are mostly made by the Levallois technique. The pebble tools are smaller and neater. Both these elements can be compared with corresponding features from the Luni basin.

MALWA AND NORTHERN MADHYA PRADESH

A small collection of scrapers, points and flakes was made by A.P. Khatri from the Shivna in Malwa. There appears to be very little Levallois element in the industry. Though scrapers and points are common to Rajputana and Malwa, the industry of the latter region is at present poorly known.

Recently a large collection of Middle Palaeolithic tools has been made by Rameshwar Singh from the Betwa and its tributaries in Northern Madhya Pradesh. A preliminary examination of the collection shows that it is closely similar to the Rajputana material. The flake component is predominantly Levallois and a number of specimens are indistinguishable from those of Rajputana. Retouched tools including various types of scrapers, points and borers seem to be fairly common. Another link with Rajputana lies in the presence in Singh’s collection of Late Acheulian ovates and a few double pointed bifacial tools unquestionably derived from handaxes.

NARMADA VALLEY

In the stratigraphical sequence of the Narmada as worked out by De Terra and Paterson the third group consisted of basal gravels and sands and overlying regur or black soil. The gravels were composed of pebbles of flint, jasper, chalcedony, trap and quartzite. These gravels and a few feet of the clay yielded a flake assemblage characterised by

1. Khatri, A.P. (1958) op. cit.; and

the absence of handaxes or large cores and by the dominance of small blades and scrapers." The authors thought it to be a proto-Neolithic or later industry because of its supposedly post-Pluvial age. Unfortunately De Terra and Paterson did not illustrate any specimens and hence no idea can be formed of the industry.

During the last few years the departments of Archaeology of the Deccan College, Poona and Baroda University have brought to light a flake industry from the Narmada near Maheshwar. The industry here appears to belong to the second terrace of the Narmada. Tools comprise mostly side and hollow scrapers, the latter often having an incipient point. There are some Levallois flakes as well as a few angle burins. Thus though the industry in its contents is similar to that of Rajputana, its range of type is much limited, it lacks several features of the latter industry such as handaxes, bifacial points, flake knives and large scrapers. The Levallois element is also small and less refined. Nor are true blades mentioned from the Maheshwar area.

Another site in the Narmada is in the upper reaches at Bhera Ghat in district Jabalpur. Here tools are found both loose and in a gravel resting on the bed rock. They included prepared core flakes without faceted platform, blades, side and hollow scrapers, discoids, blade-flake cores and two handaxes. All these elements occur in the Luni basin. However in

the Bheraghat assemblage points and borers are conspicuous by their absence.

GODAVARI-PRAVARA VALLEYS

An agate flake knife showing signs of use was found by A.E. Wynne near Pathon in the upper Godavari valley in association with Elephas mamadicus fossil. Later in the early forties of this century Sankalia discovered a number of small flakes from the Godavari and its tributary, the Kadva below Nasik. The typology of these flakes at the time of their discovery could not be appreciated properly, but now they can be ascribed to the Middle Palaeolithic. More tools have since been found from the Godavari at Kalegaon and Belpandhari and the industry is similar to that of the Pravara described below.

The stratigraphical sequence of the Pravara at Nevasa has already been described in the previous section. The Nevasian culture derives its name from this site. The industry comprises scrapers, points, borers, flakes, blades and cores, and shows a close similarity to the industry of the Luni basin. Indeed a few of the specimens look almost identical. This similarity is specially striking in the case of the Levallois flakes.

1. See, Bruce Foote, R. (1916) op. cit. p. 17/-

Compare for example;

1. NVS 253 (Fig. 58, No. 3) with JtH 113 (Pl.XXY Fig. 2);
2. NVS 374 (Fig. 59, No. 4) with PPD 17 (Pl.XXX Fig. 2c); and
3. NVS 468 (Fig. 59, No. 5) with PK 20 (Pl.XYY Fig. 11).

Points with a crudely made tang also occur at Nevasa but they are absent in Rajputana. However the range of types in the Nevasian of the type site is limited in comparison to the industry of the Luni basin.

**BOMBAY AREA**

Todd had found two blade and burin industries overlying a succession of Lower Palaeolithic industries. Recently Malik has made a number of finds of Middle Palaeolithic tools from several sites originally discovered by Todd. His collection, however, consists only of scrapers almost to the complete exclusion of other types. However, the collection made by Dr. Sankalia, Dr. Mohapatra and myself includes some typical Levallois flakes, points and cores. Some of these can be compared with specimens from Rajputana. But generally speaking the Khandivili assemblage is poorly developed.

**KURNOOL**

In the archaeological sequence postulated by Cammiade and Burkitt for Kurnool the handaxe-cleaver industry was succeeded by a flake industry which was again followed by a blade and burin industry. Recently Issac has 1. Sankalia, Deo and Ansari, *op. cit.*, pp. 103-104.
given a more comprehensive picture of these industries. The flake industry comprises mainly scrapers and points but borers, burnins and flake blades also occur. Though normally tools are made on flakes, pebbles have also been used for this purpose. This is also true for Rajputana. Another common feature in Rajputana and Kurnool is the presence in both the areas of tools derived from the earlier culture such as diminutive handaxes, bifacial points and relatively large scrapers and choppers. But in general the Kurnool industry presents a rather crude appearance. Well-finished tools are not common and slender Levallois flakes as also tortoise cores are rare. Blades occur in the succeeding industry in Kurnool which Issac calls Upper Palaeolithic. These can be compared with thicker blades from Rajputana.

ORISSA

The Middle Palaeolithic culture of Orissa is known from the valleys of Brahmani, Baitarni and Burhabalang. There are characteristic Levallois flakes in the industry though no tortoise cores have been found. Other types include scrapers of various types, retouched points, borers and angle burins. The latter of course do not occur in Rajputana. From one site a fresh Acheulian handaxe was also found along with Middle Palaeolithic tools. In tool types there is a close similarity between the Orissa and Rajputana industries; individual similarities have already been noted out in Chapter VII. The only difference is that some of the features of Rajputana such as bifacial points and flake knives are missing in Orissa.

In Central Asia in Soviet Uzbekistan several Mousterian sites have been found, the most important of which is undoubtedly the cave of Teshik-Tash. This cave has yielded a typical Mousterian industry along with a burial of a Neanderthal child. The artifacts show a close similarity to those of the Luni basin. In fact, as is clear from the description of the tool types and as will be shown presently by a comparative study with Western Asia, the Middle Palaeolithic industry of Rajputana shows a close similarity to the Mousterian of Europe and Western Asia. Nearly all the types mentioned at Teshik-Tash are represented in Rajputana and much similarity can be seen in individual tool types. Discoidal cores illustrated by Movius (Fig. 11, Nos. 1-3) are similar to SRT 1 (Pl. Fig. 4). Side scrapers on flakes have exact parallels in Rajputana. Choppers illustrated by Movius (Fig. 12, Nos. 2, 3, 5) can be compared with the scrapers of group I from Rajputana though the latter are more symmetrical and better made. As in the Teshik-Tash the large scrapers from the Luni basin are made on nodules and not on flakes; they are steeply worked, have an oval, rectangular or triangular outline and retain much of the original cortex on one or both faces. Scrapers made on Levalllois flakes and double side scrapers are also present in the Luni basin. Many are broad in relation to their length. Similarly there are coarse flakes, flake blades and Levalllois flakes. There are many specimens with bulb of percussion situated obliquely to the longer axis of the flake, a typical feature of other classic Mousterian assemblages. The same similarity of

2. Ibid.,
3. Ibid., p. 396.
can be seen in the points on triangular flakes and leaf-shaped specimens.

As has been said earlier the earliest culture over most of Western Asia is Mousterian. Two traditions are distinguished in the Mousterian here; (i) Mousterian of Levalloisian facies; and (ii) Mousterian of Yabrudian or non-Levalloisian facies. The former is widespread than the latter. Garrod had called it Levalloiso-Mousterian but Howell prefers to call it Mousterian of Levallois facies.

At Mount Carmel three Mousterian levels occurred in the et-Tabun cave the earlier two of which (B and C) were grouped as Lower and the succeeding level (B) as Upper Levalloiso-Mousterian by Garrod. Both Groups were characterised by similar typology, namely side and end scrapers, retouched points and burins, the only difference being the greater proportion of Levallois flakes in the Upper Group. Handaxes also occurred in the Lower Group but Garrod believed them to have been derived from the earlier level E. The Mousterian industry of the cave of Shukba in the Judean hills is similar to that from the Upper levels of et-Tabun whereas that of es-Skhul resembles the industry of the Lower levels of et-Tabun. Several sites are known from the Judean desert, some similar to the Upper level of et-Tabun, others to the Lower levels.

The only stratified site east of the coastal highlands is Yabrud shelter I in the Wady Skifta in the Anti-Lebanon Mountains of Syria. Here 25 Mousterian levels were found. Howell distinguishes two facies in the industrial sequence; (i) an Yabrudian facies in levels 25-11 and (ii) at Levallois facies in levels 10-2. In the former handaxes occur almost

1. Garrod and Bate (1937) op. cit., p. 6.
3. Ibid., pp. 22-23.
constantly; the commonest types are side and angular scrapers; points are fewer and burins still rare. The percentage of Levallois flakes is generally less than eight. In the Upper levels handaxes are rare; points considerably outnumber side scrapers. Angular scrapers are almost completely absent but burins are fairly common. The percentage of Levallois flakes is fairly high, above 20%.

Recently in the cave of Jerf Ajila in Central Syria near Palmyra has provided a series of Mousterian levels, all characterised by the Levallois technique. The assemblage at the base also contained handaxes while upper levels contained usual side scrapers, points and burins. The next to topmost Mousterian horizon has provided a radiocarbon determination of 43,000-2,000 years. All the Mousterian probably belong to the initial phase of the Last Pluvial.

Several Mousterian sites are known in the Zagros foothills of southern Kurdistan. The Cave of Hazar Merd has yielded Mousterian industry of Levallois facies with handaxes at the base. Other caves which have yielded similar industries are Shanidar and Babkhal. Another site in the same area is Barda Balka which is dated early with in the Last Pluvial. The assemblage here included besides usual side scrapers and points handaxes and some chopping tools with East Asiatic affinities.

It will be no use to point out individual similarities between artifacts from Rajputana and Western Asia since these can be detected in many specimens. The similarity between side scrapers, points and Levallois flakes is clear though the proportion of the latter is much less in the Luni basin than in the Mousterian of Levallois facies from Western

1. Ibid., p. 24.
Asia. Another common trait is the presence of highly evolved handaxes. Finally it must be noted that the central Asian sites and that of Earda Balka in Iran also share with Rajputana chopping tools, (described as bifacial scrapers of Group I: Figs. 1, 2, 4.) an essentially East Asian trait. It is significant that these are also the nearest Mousterian sites to Rajputana. The one important difference lies in the absence of burins in Rajputana. It is, however, abundantly clear that the Palaeolithic industry of Rajputana belongs to the same tradition as the Mousterian of Western Asia.

**EUROPE**

In Europe the Levallois technique appears toward the close of the Riss glaciation but its main development takes place in the following Interglacial period. Levallois industries are confined to the handaxe zone of south west Europe and several stages have been distinguished in their development. No pure Levallois industry occurs in Rajputana but Levallois flakes occurring in the Middle Palaeolithic industry can be compared with those of the Levallois industries of Europe.

During the same period a slightly different industry was practised in the Weimar region of Northern Germany. In it more attention was paid to the secondary work on the flakes than to the primary preparation of the core. McBurney calls it the earliest Mousterian.

The typical Mousterian belongs to the early part of the Last Glacial. McBurney distinguishes two variants in it; (i) Western Mousterian and (ii) Eastern Mousterian. The former coincides more or less with the

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2. Ibid., p. 32.
area of the handaxe culture and comes mostly from the caves. The latter occurs over a large area in eastern and central Europe "from the Rhine to the Oxus in the Western bastions of the Himalayas."

In the cave Mousterian of south west France McBurney distinguishes three facies:

(i) Classic Mousterian: Moderate sized broad flakes generally with faceted platforms struck convergently from the thick upper face of a flat disc shaped core together with numbers of coarser flakes struck from simpler forms of core. Secondary work confined to upper face and varies in extent from one assemblage to another; occasional elongated flakes but no blades.

(ii) Stratified over or under or intercalated with (i) and containing all forms (i) and small triangular or roughly cordiform handaxes. Other Acheulian forms absent.

(iii) Higher variation and standard of finish in the retouched tools. Handaxes rare or absent. Other peculiarities include removal of bulb on points and scrapers and a decrease in the relative thickness of the flakes.

The Eastern Mousterian is distinguished by the characteristic Middle Palaeolithic device of faceted platform flaking from disc shaped cores. Cordiform handaxes are rare or completely absent. Other features are the following:

(i) Size of the tools is generally thinner than in the Western Mousterian;

(ii) Presence of a narrow strip like flake with abrupt retouch down the working edge.

(iii) Very abundant, thick stubby points of minute size, true awls and numerous variants of fusiform and limace shape.

The retouch on the flakes is generally executed by a technique which McBurney calls Plano-convex retouch. "This technique consists in thinning the bulbar face with a series of remarkably flat, shallow scars subsequently truncated with a normal retouch directly on to the dorsal surface."

The Palaeolithic industry of Western Rajputana shares some features with both Western and Mousterian. The scrapers and points are common to the Mousterian of both the areas as well as the industry of the Luni basin. The latter shares small evolved handaxes and Levallois flakes with the Western Mousterian and awls and thick points with the Eastern. Though the thinning of the bulb is not so common in the flakes from the Luni basin, retouch is mostly executed from the dorsal face. Discoidal cores of the typically Mousterian type also occur in Rajputana.

NORTH AFRICA

The Middle Palaeolithic in North Africa as Movius has pointed out, was very wide spread and lasted over a long duration. In the Nile valley industries of this period occur along the entire length of the river in at least four different stratigraphical horizons, namely the 9 m. terrace of Nubia and Upper Egypt, the 3-4 m. terrace of Middle Egypt, the 8 m. terrace of Lower Egypt, and the silt phase at Kom Ombo and Fayum. Sandford and Arke used described the Middle Palaeolithic industry as Mousterian but

actually as has been pointed out by Caton-Thompson it is a developed Levallois industry. Indeed the typical tools of the Mousterian side scrapers and points are almost completely absent and their place is taken by very fine Levallois flakes which were used as tools without any retouch. The finds in the 9 m. terrace have been rare but they indicate a transitional phase between the earlier handaxe industry and the later developed Levallois industry. It includes highly evolved handaxes along with flakes made by a rudimentary Levallois technique. This shows much similarity to the finds from the Luni basin. The triangular handaxe from the 9 m. terrace looks an enlarged version of LNI No (Pl. XLV Fig. 6), and is technologically similar to SNG 14 (Pl. XXXIII Fig. 6). In the industry of the 3-4 m. terrace handaxes are almost completely absent and the Levallois technique has advanced enough to produce beautiful triangular and rectangular flakes. Flakes—blades also occur. The long rectangular core may be compared to LNI 204 (Pl. XXXIII Fig. 5) which because of its over-all form has been classified as a cleaver.

The industry of the 8 m terrace is similar to that of the 3-4 m. terrace. It includes similar well prepared cores and "sharp neat flakes eminently suitable as lance heads or knives with little or no secondary work".

A similar industry occurs in the 28 m. beach of the Fayum.

2. Sandford, K.S. and Arkell, W.J. (1933) Palaeolithic Man and the Nile-Valley in Nubia and Upper Egypt. Pl. XIX, Fig. 23.
3. Ibid., Pl. XXXIII. Fig. 27.
The leaf-shaped specimens from this horizon bear great similarity to specimens like INI 113 (Pl. Fig. 2.) Finally in the silt phase at Kom Ombo and in the 20-24 m. beach of the Fayum a distinctive industry is found which though basically Levallois is much diminutive in size and includes besides flakes such diverse elements as retouched blades, micro burin and geometrical forms. In the absence of more reliable stratigraphical evidence this industry must remain enigmatic.

In spite of the individual similarities pointed out above it must be mentioned that the Levallois industry of Egypt is far more highly evolved than that of Rajputana.

A rich sequence of stone age industries has been worked out in the Kharga oasis by Misses Caton-Thompson and Gardner. Most of the earlier industries occur in spring deposits. The earliest finds belong to a Late Acheulian industry which is accompanied by a rudimentary Levallois technique. Its pear shaped handaxes are similar to those of the Luni basin. Compare for example Fig. 13 No. 1 in McBurney with SN 14 (Pl. Fig. 6.)

In the succeeding industry fine handaxes occur together with a true Levallois technique. Handaxes are often of an oval outline. INI 54 (Pl. Fig. 4) is much similar to Fig. 14 Nos. 1 and 2 in McBurney. In the succeeding assemblage handaxes completely disappear but a remarkable progress takes place in the Levallois technique. Besides the flakes are worked by secondary...

1. Ibid., Fig. 11 No. 147.
2. Ibid., p. 147.
4. Ibid., p. 154.
flaking into cutting and scraping tools comparable to the Mousterian specimens from Palestine. There are also some borers and some possible missile or lance heads. A series of fine cores is illustrated by Miss Caton-Thompson. The tortoise cores from the Luni Basin may be compared with some of these. The other similarity with the Luni is the presence of borers and side and end scrapers. Compare for example end scraper in Fig. 15 No. 3 in McBurney with DNR (Pl. XLI Fig. 5) and Levallois flake Fig. 15 No. 6 with HDG (Pl. XLIV Fig. 9).

Another Middle Palaeolithic industry of North Africa which may be mentioned here is the Aterian. Its main area of development is the Atlas Massif but sporadic infiltrations occur as far east as the Libyan desert. It is a highly specialized industry in which elaborate primary flaking of tortoise cores is combined by secondary work on the flakes of a very high order. Its still more distinguishing feature is the presence of a diamond-sectioned tang not only on missile or spear heads but also on scraping and cutting tools and even on plain Levallois flakes. Obviously there is nothing from Rajputana that can be compared with this specialized industry.

EAST AFRICA

In the Middle Palaeolithic of East Africa as many as four cultural traditions are distinguished. These are (i) The Levallois-Stillbay (ii) The Kenya Fauresmith, (iii) The Sangoan, and (iv) The Kenya Capsian.

The Levallois culture occurs all over East Africa including

1. Caton-Thompson, G. (1946) op. cit. Figs. 3-4.
Sudan and the Horn but is best developed in Kenya and the Horn. It occurs in the Final stages of the Acheulian during Late Kanjeran times and continues in the Gamblian pluvial. A number of sites occur in Kenya and Tanganyika. The characteristic tools of this culture are points made on Levalllois flakes, side scrapers, occasional burins and sometimes handaxes made by step flaking.

The Stillbay develops out of the evolved Levalllois. Its type tool is a pressure flaked point made from Levalllois flake. The points are leaf shaped or sub-triangular and were probably used as spear or arrow heads. Some of them are of laurel leaf shape. In the Later Kenya Stillbay such elements as backed blades, lunates and burins also occur. Bifacial points occur in Rajputana but they are not pressure flaked.

The Fauresmith and the Sangoan cultures of Africa reveal a close relation between material culture and environment. The Fauresmith is confined to two limited areas in Kenya and Abyssinia and belongs to the Kanjeran Gamblian dry Interpluvial. It occurs at high altitudes of 7,000-8,000 feet where permanent water supply was available from natural springs during the height of the dry Interpluvial.

The Kenya Fauresmith derives its name from the South African Fauresmith to which it shows close typological similarity, though its origin is supposed to be independent of South African influence. Some believe that East African Fauresmith originated through an interaction between the local Acheulian and Levalllois cultures which were contemporary during the Late Kanjeran times. In South Africa the Culture is supposed to have developed directly out of the Acheulian because here Levalllois was
already an integral part of the Acheulian. Tool types of the Fauresmith are small handaxes and cleavers, side scrapers made on Levallois flakes and stone balls. Though individual similarities may be pointed out between the Fauresmith and the Rajputana Middle Palaeolithic, the fact remains that the former is a specialized culture confined to a limited area and can not be compared with a culture belonging to an entirely different cultural tradition.

The Sangoan both from its tool types and distribution is essentially a forest culture. It is confined to the equatorial forest zone and its distribution coincides with an area which receives over 40 annual rainfall. It occurs in the valleys of the great rivers which continued to keep flowing even during the height of the dry Third Interpluvial. In the Sangoan both Acheulian and Levallois elements are intimately connected and Leakey believes it to have originated in South Africa whence it spread into Angola. The Sangoan is characterised by comparatively heavy equipment suitable to forest life. Its type tools are handaxe-like narrow elongated picks, small trenchets, Levalloisian flakes, large scrapers and lance heads. There is little affinity between the Sangoan and the Middle Palaeolithic industry of Rajputana.

The Kenya Capsian which occurs toward the end of the Gamblian Pluvial is a blade burin culture comparable to the Chatelperronian, the Gravettian and the Aurignacian of Europe and is apparently quite different from the Middle Palaeolithic culture of Rajputana.

SOUTH AFRICA

The handaxe culture came to a close in South Africa toward the close of the Kanjeran times. In the succeeding dry interpluvial two cultures appeared here. These are Fauresmith and Sangoan. There distinctive features are the same as those of the Fauresmith and the Sangoan of East Africa described above. The common feature of between the Fauresmith and the two and the Rajputana industry is the presence in of the diminutive hand- axes and cleavers. However it might be pointed out that whereas as in the Fauresmith handaxes and cleavers are primary tool types, in the Rajputana industry they form only a very small part of the total collection. Apart from this there is little common between the Fauresmith and the Sangoan on the one hand and the industry of the Luni basin on the other.

Age

The so-called Middle Stone industries belong to the end of the Gamblian pluvial and post-pluvial period. A number of cultures and variants are recognized in the Middle Stone Age complex such as Lupemban, and Sofwean in the forest country of Angola, Proto-Stillbay and Stillbay in Rhodesia and Pietersberg in the west. They are all characterised by specialised tools such as picks, boat-shaped planning tools, tramchets, parallel sided ciseaux, gouges and end scrapers. Bifacially flaked lanceolate points also occur in some of them.

None of these cultures bears any similarity to the Middle Palaeolithic culture of the Luni basin.

III

THE MESOLITHIC

Before discussing the position of the Mesolithic industry vis-à-vis other microlithic industries, it might be mentioned that microliths in India occur in two different contexts.

(i) Unassociated with metal objects, polished celts, and for the most part pottery, and comprising a variety of tool types such as blades, points, scrapers, and geometric forms suggestive of a hunting economy. In some areas, they are definitely pre-Chalcolithic or pre-Neolithic though in others they may be contemporary with the latter or even later than them.

(ii) As part of the various Chalcolithic cultures, as at Indus Valley.

1. Colonel Gordon has pointed out the presence of pottery at several microlithic sites. (Gordon, D.H. 1950: "Stone Industries of the Holocene in India and Pakistan," Anc. Ind., No. 6, pp. 64-90.) Among these are Langhnaj in Gujarat, Narve near Bombay, a rock shelter at Pachmarhi in the Mahadeo hills, Morhana Pahar caves in Mirzapur, some sites in Kashmir and some in Lower Godavari. At Langhnaj according to Sankalia the true microlithic layer is devoid of pottery (Sankalia, H.D. 1956: "The Microlithic Industry of Langhnaj, Gujarat," Jour. Gujarat. Resear. Soc., Vol. XVIII, No. 4, p. 276.). Subbarao in a fresh excavation of this site found a few highly comminuted sherds at the lower levels (Subbarao, B. 1956: The Personality of India., 2nd. Edition., pp.734-44, but they are too few and small to be of much significance and might have been introduced by artificial disturbance. Secondly Subbarao's work was much smaller compared to Sankalia.
sites, Nevasa, Navdatoli etc. Strictly speaking these are not microliths at all. There are very few finished tools in them and they mainly comprise thin, parallel sided flakes or blades which were mostly used without any retouch probably as multi-purpose household knives. A distinctive feature of these blade industries is the use of crested guiding ridge technique which is completely absent in non-Chalcolithic microlithic industries. The lack of variety in the tool types is probably due to a secondary simplification of earlier Mesolithic forms and represents an adjustment to changed requirements.

The microlithic culture of Rajputana obviously belongs to the former type and in the following pages it will be discussed only in relation to these non-Chalcolithic or Mesolithic industries.

Microlithic industries of the Mesolithic type have been found all over the country except in Assam and the Indo-Gangetic plain. The common tool types in these industries are the straight and the obliquely worked of many years and unless more evidence is brought forth, Lenghnaj microlithic culture must be regarded devoid of pottery. The extent of Gordon's excavation at Pachmarhi was, in his own words, too small to yield any reliable evidence (Gordon, op. cit. p.74) and the same is true of Todd's excavation at Marve (Todd, K.R.U. 1939: "Palaeolithic Industries of Bombay" J.R.A.I., Vol. LXIX., p. 70). Hunter's excavation at Pachmarhi also yielded little or no pottery at all in the lowest levels (Gordon, op. cit. p.75). Kashmir sites of Sombur, Pampur and Burjhom were believed by De Terra to be of Neolithic or Early Historic date (De Terra and Paterson, op. cit. p.233). However it is possible that in some of the isolated areas as in the Kaimur range and the Lower Godavari microliths might have continued till the advent of pottery but at the majority of sites they are definitely pre-pottery.
retouched blades, simple points — both symmetric and asymmetric — various
types of scrapers and borers, and occasionally burins. Among the geometric
forms triangle and trapeze occur in Gujarat, Bombay, Banda, Mirzapur and
Rewa, Central Indian sites of Jabalpur, Pachmarhi and Rajpipla, Mysore and
Kurnool. Triangle alone occurs in the Lower Godavari and Teri sites. But
the most common is the lunate which occurs in nearly all the areas. How-
ever many of the artifacts described as lunates for example from Giddalur
and Birbhanpur are only rough approximations to that type and specimens
that are made with geometrical precision rarely occur in large numbers.
On the whole geometrical forms are poorly developed both in quality and
numbers except in some of the Central Indian sites. Here in the caves and

No.6., p.6.
5. Seshadri, M. (1956) The Stone Using Cultures of Prehistoric and Proto-
historic Mysore. xxx-xivii
India., Vol. IV.
8. Zeuner, F.E. and Alchon, B. (1956) " The Microlithic Sites of Tinneval-
ey districts, Madras State.", Anc. Ind., No. 12, p.7.
Kurnool.", Anc. And., No. 8., Fig. 11, Nos. 70-71.
10. Lal, B.B. (1958) " Birbhanpur, a Microlithic Site in the Damodar Valley
West Bengal", Anc. Ind., No.14, Fig. 8., Nos. 16-17.
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<th>Backed blades</th>
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**Abbreviations.**  C: Chert;  CY: Chalcedony;  J: Jasper;  A: Agate;  F: Flint;  W: Silicified wood;  Q: Quartz;  QT: Quartzite;  R: Rock Crystal;  S: Indurated Shale;  ST: Slate;  CN: Carnelian;  O: Opal.
rock shelters of the Kaimur range well-finished geometrical forms literally in thousands. Southward at Pachmarhi in Mahadeo Hills and at Jabalpur Gordon says they are plentiful and from his illustrations they appear to be certainly well finished. Though simple points both on blades and flakes are common, bifacial and tanged varieties are extremely scarce. The former are recorded only from Teri sites and one or two specimens among the points illustrated from Kurnool may approximate to this type. Of the tanged points one single shouldered specimen is illustrated by Seshadari from a site near Bangalore and some specimens from Kurnool are illustrated by Sounderrajan and Issac. No other genuine examples are known. Burins occur in Gujarat, Bombay, Mysore, Kurnool, Orissa and at Bhirmanpuri. Of the microburin one specimen is known from the Teri sites and three or four from Bombay.

4. Issac, N. op. cit. Pl. XXV, Figs. 73-75.
5. Seshadari, M. op. cit. Fig. No. 16, No. 14.
6. Sounderrajan, K.V., op. cit. Fig. 11. No. 76-77; and Issac, N. op. cit. Pl. XXXV, Fig. 24 S-86.
11. Mohapatra, op. cit. p. 278.
13. Zeuner and Allchin, op. cit. p. 16; Fig. 3, No. 12.
14. Todd, K.R.U. (1950) op. cit. p. 11; Fig. 4, No. 77-81.
The raw material for microlithic industries is commonly chalcedony and chert, though quartz and quartzite have been used equally universally but less commonly. In Bombay area agate, chert, chalcedony and cornelian are the only materials used since quartz, quartzite or other rocks do not occur in the area. In the microlithic assemblage of the Balia Nadi in Singrauli basin only milky quartz has been used. Materials like flint, rock crystal and silicified wood are extremely rare.

At the majority of the sites microliths occur on surface and provide little basis for dating. However in some areas they have been found in stratified contexts and from these a general idea of the antiquity of microlithic industries in some areas in India can be had.

At Rangpur, a Harappan site in Gujarat, S.R. Rao found a microlithic assemblage comprising typical geometric forms and unassociated with pottery in a gravel lens below the Chalcolithic layer. In Bellary Subbarao discovered a crude microlithic industry below the Neolithic layer and separated from the latter by a deposit of barren soil. There are very few finished tools in this assemblage probably because of the poor raw material which is quartz. These assemblages are therefore clearly pre-Chalcolithic and pre-Neolithic respectively.

Evidence of a different kind is available for dating the microlithic industries of Gujarat, Bhirhanpur and Teris. The Gujarat microlithic industry belongs to a buried soil horizon and represents

2. Krishnaswami and Soundarryan, (1951) op. cit., p. 59.
a climate wetter than the present as well as that which preceded the micro-

lithic phase. The animal and human bones found here were in a semi-fossi-

lized state and the fauna was all of hunting type. For these reasons the

industry may be considerably old - perhaps as old as the post pluvial wet

phase. At Birbhanpur the microlithic horizon was underlain by a laterised

soil which indicates a wet climate of pluvial type and may belong to

the last pluvial period. On this showing the microlithic industry will be

of Early Holocene age. The Teri site is dated by Zeuner to about

4,000 B.C. with the proviso that further geological work may push them back

into the Pleistocene. Thus in general it might be said that some of the

microlithic industries of India are of considerable antiquity—perhaps as

old as the beginning of the Holocene.

Now typologically Rajputana microlithic industry

taken as a whole hardly offers a parallel to any other microlithic indus-

try in India. In so far as it completely lacks all geometrical forms inclu-
ding the lunate, it is unique and may be regarded as the most primitive in

industry so far known. Its two other distinctive features are bifacial

points and tanged points or arrow heads. The former can be compared to the

bifacial points from the Teris but the latter appear to be better made.

A few specimens illustrated by Isaac from Kurnool are made on flakes and

the lower face only partly worked. The Rajputana specimens are both on

flakes and on fresh nodules and are more fully worked. The tanged points

p. 6
4. Issac, N. op. cit. Pl. Figs. \( l \times x \), Figs. 273-375.
from Rajputana are better made than any other specimens so far found from other Indian sites. One unfinished bead from Potla is the only specimen of its kind and may not be of much significance.

As far as raw material is concerned, the Rajputana industry offers the widest range of materials used. Practically every material used at any other site has been used here. The presence of beautiful fluted cores in quartz, quartzite and rock crystal alongside those of chert and flint suggests that the microlithic man had complete mastery over the technique of blade production.

For dating the microlithic culture no direct evidence is available from Rajputana. The absence of pottery as well as the crested-guiding ridge technique suggests it to be pre-Chalcolithic. Both in Western and Eastern Rajputana Chalcolithic sites occur in the vicinity of the microlithic sites. If the microlithic sites were contemporary with the Chalcolithic culture they would certainly be influenced by the latter. Typologically the nearest parallels of the Microlithic industry of Rajputana are the industries of the Teri sites and Birbhanpur both of which are of high antiquity. In fact the Rajputana industry because of the complete absence of geometric forms is more primitive than either of these two. On this basis also it will be fairly old though to suggest any date in absolute years will be no more than a conjecture.

No comparison is sought with the microlithic industries outside India primarily because the microlithic industry of Rajputana, as has been pointed out in chapter VIII, is at present very imperfectly known and secondly because no particular culture outside India shows any close similarity to the Rajputana industry.