CHAPTER I

DAWN OF INDIAN TECHNOLOGY

1. Background History of Palaeolithic Research in India

The history of Palaeolithic research in India is more than a century old. The initiation of such study was made by Robert Bruce Foote, a geologist by profession. In fact, the first Palaeolithic tool was collected by him from a laterite gravel deposit at Pallavaram near Madras in the year 1863, and ever since Palaeolithic tools have been found from different parts covering the whole of Indian sub-continent except the alluvium corridors and some other places where the climatic condition did not favour the growth of Palaeolithic habitation. Since the initial recognition of Palaeolithic tool in 1863, there has been significant changes in our approaches to the study of prehistory of the Indian sub-continent largely replacing old ideas by new ones, and this happened to emerge through four successive stages of developments. In the new conceptual framework that emerged through persistent efforts...
during the last hundred years, the entire stone age culture has been divided as Palaeolithic, Mesolithic and Neolithic cultures with a further sub-division of Palaeolithic culture as Lower Palaeolithic, Middle Palaeolithic and Upper Palaeolithic.

In the initial stage which continued up to 1935, the major objective of prehistoric research in India was collection of stone artifacts and typological analysis. During this period most of the scholars were Europeans. Some time later Foote and W. King, discovered various kinds of tools in the old beds of the rivers Korttalaiyar and Narnavaram both in Tamil Nadu. In 1865 Wynne discovered them near Paithan in Maharashtra, on the upper Godavari river. Hacket found them at Baitara on the Narmoda river in the year 1873. The first Palaeolithic tool in eastern India was collected by V. Ball in the year 1865 from Bengal. He also found at least four different sites yielding Palaeolithic tools in Orissa in 1875. In 1883 Cockburn and Wynne jointly found prehistoric stone tools from the Singaruli basin in South Mirzapur along with fossils of Mammalian animals which belonged to the pleistocene phase. The finds discovered till the 1920's were collected mainly from the surface and referred to by the European cultural nomenclatures on the
basis of their typo-technological similarities as could be linked to their European counterparts. Some of these and other stone tools collected from different parts of South India were sent by Cammaïade and Richards to Burkitt in Cambridge. Later Burkitt and Cammaïade (1932) classified the materials mainly collected from Kurnool district of Andhra Pradesh and offered their series concept. They designated the Indian stone age as series I to IV. However, the concept or nomenclature offered by them did not work for long. Because the classification was perfectly alright for a specific area, but it can not be operated in a wider area. Naturally the idea was subsequently dropped.

The second Phase which continued upto early sixties may be considered as the beginning of scientific study of Prehistory in India. In 1935 De Terra and Paterson of Yale-Cambridge universities extensively explored in the Patwar region of North-West India and for the first time attempted to correlate the Soan industry found from different river terraces of Soan river with the pleistocene sedimentations. On the basis of their work, they claimed that Soan Industry comprising chopper/chopping tools and flakes represents an unique development of Palaeolithic culture which was quite distinct from the existing Abbevillian / Acheulian
culture dominated by handaxe/cleaver industry. This idea of two different parallel traditions was further consolidated by H.J. Movius in a wider perspective. They further contended that the Indian chopper/chopping tradition had its origin in Anyathian of Burma and Choukoutien of China while the handaxe/cleaver tradition originated in Africa. Naturally the prehistoric study of the post-independent India was very much influenced by this idea. Some of the Indian scholars even suggested Narmada valley as the meeting place of both the traditions. Their major defence of argument was the discovery of tools belonging to both the groups in Narmada valley. They further suggested that chopper/chopping group gradually became extinct as a consequence to their interactions with the handaxe/cleaver group or they were absorbed within handaxe/cleaver group which continued to evolve through space and time before it finally gave rise to Middle Palaeolithic flake industry. The idea has been rejected with the discovery of handaxe/cleavers from North/West India.

The third phase which started from early sixties was dominated by a group of scholars who advocated the idea that Indian handaxes/cleaver industry developed from pebble chopper/chopping industry through a proto-handaxe stage.
The idea was advocated and supported by Khatri and Armond on the basis of their excavations. But unfortunately the discovery of chopper/chopping pebble tools together with handaxe/cleaver from the same geological horizon in different parts of India virtually discarded the theory.

The final phase which started from early seventies was dominated by a group of scholars like Misra, Mahapatra, Pappu, Padhayya, Ghosh etc., who advocated the idea of a single lineage in which chopper/chopping tools are considered as constituent elements of Acheulian culture. In the new scheme, the earlier term Abbevillian has been dropped and the whole Lower Palaeolithic complex has been designated as simple Acheulian in which chopper/chopping tools are also included. The idea gained support with the discovery of handaxes from China and South-East Asia. But despite of this kind of recent development, we still find the use of terms like "Soan Culture" or Soan industry without much justification.

2. Techniques During the Prehistoric Period

Technology is an important aspect of culture. Culture cannot exist without technology. The material manifestation of man during the remote past could not be made
possible without the help of technology. So technology played an important role for the emergence of culture. We do not know exactly when, where and technology appeared in human society. It seems that a technological sense is an essential feature of the human character itself. We can assume that the first attempt by our early ancestors to strike a flake from a chunk of rock may be considered as the beginning of technology. Detailed study of the individual stone tools as well as collective surveys of the finds from different parts of the country show us the progress in the techniques and skills shown and employed by Palaeolithic inhabitants at different stages. Some of the earliest methods of tool-making are described below.

I. Anvil or Block-on-Block Technique

In this method the hammer was a fixed block of stone and the stone from which the flake was expected to be detached was swung against this fixed anvil. It also required the knowledge of the correct angle at which the stone was to be struck against the anvil. Generally large flakes with prominent bulbs, which we find in the Narmada and the Early Sohan and also the Clactonian were probably
obtained in the manner postulated by the Abbe Breuil and L.S.B. Leakey. Breuil thinks that the block of stone from which a large flake was to be removed was tied to the end of a leather thong, the other end of which was fastened to a rough wooden tripod, and that the block was swung like a pendulum against the anvil. Though Leakey do not believe in the accuracy and the commonness of this method.

II. Direct Percussion or Hammer Stone Technique

In this method a large pebble is used as hammer stone to strike on a suitable stone in such a manner as to detach a flake from the solid figure of the stone. When a blow is struck upon a piece of stone with a convex surface of a waterworn pebble, it breaks under tension round the periphery of the area of contact and a crack spreads rapidly downwards and outwards. It is generally held that a blow with a hammerstone causes shattering. But if the blow is given at a correct angle and if the stone struck is of a suitable texture, it punches out a complete core. When our prehistoric inhabitants started making flakes, they had first to learn the exact angle at which to strike a blow before they could be certain of detaching a flake at the expected point and in the desired direction. Leakey further states that
This block was at an angle of roughly 120° to the direction in which he desired to remove the flake, and also at a point near the edge from which the flake was to be detached. In this way only a part of the core of the force penetrated the stone. Thus a flake was detached with a well-marked semi-cone or bulb of percussion marking the point of impact of the hammerstone.

It is interesting to note that a chip will come off not from the surface on which the blow is given, but from the lower surface. Later to remove another flake from the surface, the side will be turned and a blow will be given in the same way. Thus by alternate flaking a tool of required shape and size is prepared.

III. Controlled or Step Method Technique

This was followed by the step or Controlled Technique of flaking. While striking to flake a pebble or a mass of stone with another stone the maker has to control the force of his stroke. This is possible if the maker holds the pebble to be flaked at his left hand and hits gradually by his stone hammer on the periphery of the
pebble. The flake scars are smaller, shallower and leave a step like mark, as the strokes do not go much deeper, and are against the body of the tool. A stroke against the centre or thickness of the pebble does not go very deep and gradually leaves a 'step'. Leakey states that small hammer stones were used for this and other kinds of secondary work. The lengthwise outline of many hand-axes as well as cleavers are found slender in this way.

IV. Wood or Bone Hammer Technique or Cylinder Hammer Technique.

These were followed by Cylinder Hammer. The latter might be of bone, wood or stone, having a smooth and even surface. Such a surface could be obtained by using a hard wood, bone or stone and striking in such a manner that the force of the stroke is directed at the actual edge of the stone struck and a little distance in from the edge. It is certain that such tools reveal a greater technical development and a sense of planning and design not evidence in the other percussion techniques.
Leakey believed that a cylinder hammer, whether it be of stone or wood or bone, would yield a fine result.

The difference between an ordinary hammer and a cylinder hammer is that in the latter the undersurface - the divergent course of the cylinder - appears into contact with the stone to be struck and not the narrow edge of the pointed tool. The product flakes are generally thin and flat with a diffused bulb on the underside. This type of tools were first found at St. Acheul in France and hence known as Acheulian. In India, such tools occur together with the Abbevillian and do not show any chronological sequence.

V. Levallois Technique

It was first found from Levallois Perret, and hence the technique was called Levalloisian. In Punjab, De Terra and T.T. Paterson noticed that flakes with Levalloisian character appears only in the late Soan - A, during the third Glacial times. In the rest of India, the picture is not clear. There is no stratigraphical evidence to divide various handaxe groups. It appears to be that the true Levalloisian flakes are later than the early Abbevillian type of handaxes, but are connected with the finer Acheulian handaxes.
The Levallois flakes are a peculiar type of flakes struck from a prepared core. Starting with the rough trimming of the sides of the core, the technique involved knocking off upper surface flakes in such a manner that flake scars were usually left in the centre and the surface of the core was well dressed in a rounded form. By subsequent horizontal flaking at the top of the dressed region, a flattish surface called the faceted striking platform was formed. Ultimately, by hammering the striking platform vertically down the length of the dressed area of the core, tiny and long flakes of required form were detached.

The outcome was that a fine, symmetrical, fairly thin flake was produced. It had a clean under surface, and required no further trimming. It might be mentioned here that all these flakes and cores do not show all these characteristics nor it is the case in the Levallois Perret in France. The prepared core looks like a tortoise shell, particularly the back side. Therefore, the name tortoise core. In Levalloisian method, though each time only one flake can be obtained and every time the core has to be prepared again, making the method lengthy and time consuming, the desired size and quality of the artifacts (flakes) are obtained and it is on the whole a very economical process.
VI. **Blade Technique**

Every blade must be a flake but all flakes are not blades. A 'blade' means that it is thin and slender as opposed to thick or broad. In the previous methods (i.e., the Clactonian, Levalloisian and Mousterian) we find that the core were usually flat; the platform wide and faceted and the flakes round, oval, or triangular. But in the blade technique we notice that the core is generally cylindrical and 'flunted', the flakes long, narrow, and slender and the platforms of the flakes show minute facets.

The blade flake technique was probably the earliest discovered. The blade flake is long and comparatively narrow with more or less parallel edges. Such blade flake are to be found in Early and Middle Stone Age cultures, but regularly in the Upper Palaeolithic culture or the true blade-flake cultures. The method employed for obtaining such long, narrow flakes with parallel is as follows:

Firstly, the nodule or flint or fine grained stone, such as chart, is halved in order to have a formidable flat striking platform for a blade-flake core. So far as possible the surface of the broken half should be parallel, without the concavity of a negative bulb of percussion. That is why it is called quartering of the stone or the
nodule. After it starts the preparation of the core for the removal of blade flakes. Then the quartered block is held on the knee with the striking platform facing obliquely upwards. About an identical technique is still practised by the stone workers of Cambay.

Secondly, by a small hammerstone, blows are struck along the border, just above the point where the block rests on the knee. Every strike is struck, the cone is gradually tilted backward, converting the point of pressure against the knee, so that the desired effect of peeling is produced. Next each flake has been struck, the block is triflingly rotated about its own axis. So that successive flakes can be removed round the border of cone. In this way irregularities on the block can be removed and then all the flakes are removed in the same desired direction, a fluted appearance outcomes, because of parallel negative flake scars.

This technique of producing flakes was continued in the Neolithic and Chalcolithic period with a little change. On the basis of the raw material, the core and the flake tended to become smaller. For example, the flakes and cores of the Harappan culture are generally three to five inches
long, but in other periods, which used basically chalcedony available at different indigenous sites, the cores differ from one inch to three inches and the flakes are certainly smaller, narrower and thinner.

VII. Pressure Flake Technique

Thin, long, slender blades were also manufactured by a pressure technique. Whatever technique was taken the core had to be first made. The core was tabular removed from a quarry or mine or natural nodule from a river bed. Man had discovered the pressure fabricator. It was not particular in form, though a rough flake on which there was somewhere a throaty, more or less rectangular, border. The main cause of roughening was to enable the produces to prevent the punch on the core, when it was struck or pressed, from slipping. Another process in the preparation of the core was also taken. Small platform were prepared along the border of the core. This platform was very simple and is called 'faceted'. In India during the Neolithic-Chalcolithic times, the core was again made by shaping a ridge on it by alternate flaking. This is made by preparing a series of flakes along the lengthwise axis and at
right angles to its face along one border. On the other hand another series of flakes is prepared from the opposite side, with the negative scars of the primary flaking served as platform. It appears that the earlier flake scars are cut short and a long narrow elevation with a zigzag border is manufactured.

Lastly, Leakey believed that for making a lunate, or a small crescentic stone blade, a type of fabricator was invented called lame e' caille e. By a few movements of this tool a whole series of tiny flakes could be spontaneously rushed off, thereby transforming a narrow blade-flake into a lunate.

VIII. Created Ridge Technique

This type of blade flakes were manufactured in Chalcolithic and Bronze Age cultures which were familiar with the 'created ridge or the gilding flake' method. In this method, all the irregularities which could be easily transferred from a whitish quartz nodule were first taken off by a round stone driving nail. On the other hand, a long narrow elevation was made upon along the length of the manufactured core by alternate flaking. This long narrow
elevation is supposed either to guide the regular removal of parallel bordered flakes or it marked a line of fragility which makes it easy for the transfer of the primary series of flakes. This type of crested ridge flakes are to be found in the Harappan cultures also. Subbarao thinks that for the huge production of blades this was very convenient technique in the prehistoric period.

IX. Grinding and Polishing Technique

The last technique of this period called "Grinding and Polishing". In this method a pebble or nodule or a mass of stone, more desirable dyke basalt, was first, flaked by the stone hammer, control and pressure techniques. More or less a uniform surface of exterior was achieved. After this followed pecking by which all unequal exteriors were removed with a chisel-like tool. Thereafter, this incomplete tool was ground in boat-shaped sandstone or rough exteriored querns, with a little water and abrasives, but these are not quite important, if the exterior is rough. Slowly the exterior was smoothed. When the prehistoric inhabitants was so serious about the border part, this was again ground, until it became desirable smoothly, and
possible with a little change of some oily substance, the exterior was prepared glistening. In this way the pointed butt axes, chisels and other wood working of the New Stone Age was made. This can be found in different parts of the Indian subcontinent, e.g., Andhra, Madras, Mysore, South Eastern U.P., East and West Panjab, Burzahom in Kashmir and Assam. Dani emphatically states that in Eastern India, particularly Assam, shouldered pointed butt axes were manufactured by wire-cutting.

3. **Stone Age Tools : Their Nature and Functions**

There is hardly any doubt that our Palaeolithic ancestors extensively used both organic and inorganic materials for the manufacture of artifacts. But the possibility of survival of organic materials like bone and wood is very remote. Naturally we have to depend on inorganic stone materials which can survive through time for the reconstruction of history. The early men exploited different types of rock materials. Again each rock has its own chemical properties which largely determine the nature and character of rock. In India, the early men extensively used Quartz and Quartzite for the manufacture of tower Palaeolithic
tools. It is only during the Upper Palaeolithic culture that they largely shifted to crypto-cristaline silica group of materials like Chert, Flint, Agate, Chalcedony, Jasper etc., for the manufacture of artifacts, and that too became necessary to work with the new blade technology offered a wide range of refinement and modification in the tool kit of our early ancestors. We can classify the form of raw materials used during the entire stone age culture as pebble, core, flake and blade. During Lower Palaeolithic period, the basic form of raw materials were pebble and core with occasional use of flake. During Middle Palaeolithic culture the basic form of material was flake and hence the industry is designated as flake industry while the Upper Palaeolithic culture is characterised by a flake-blade industry. This blade technology initially introduced during upper Palaeolithic culture finally culminated during subsequent Mesolithic culture of the Post Pleistocene period.

On the basis of morphology, working edge, supposed function and associated technology, we can classify the entire stone age artifacts as follows:
Pebble Tool: Generally the term is used to denote any tool made on a pebble. It also denotes a different class of scrapers, choppers and hand adzes in which only the working edge is flaked. These tools are specially characteristic of the Lower Palaeolithic culture of India.

Chopper: A stone tool generally made on pebble, but occasionally they are found on core. These are massive and of large size used for multivariate purposes. It is worked on one side only and so it is an unifacial tool. Choppers are the main characteristic tools of the Lower Palaeolithic culture. However, it reappears during Upper Palaeolithic culture in some parts of India.

Chopping Tool: A stone tool made of pebble or split pebble core which has been flaked successively from both surfaces in such a manner that a ragged wavy cutting edge results, and the rest of the surface retaining the original form. It may be presumed that these tools were probably used for chopping meat, wood and other necessary things. This kind of tools are heavy, large and bifacial. They belong to Early Stone Age under Palaeolithic culture but also reappear in Upper Palaeolithic culture, but later their size had become smaller.
**Cleaver** : Another important tool type which certainly belongs to the hand-axe complex is cleaver. These tools were used for cleaving or cutting and seems to be a distinct prototype of the flat copper and bronze axes of the later periods. A cleaver can be prepared of a flake or a core. The upper portion virtually retains the original surface while the lowerside ends in a wide chisel-border formed by intersection of two large flake scars inclined to one another at an actual angle. On the basis of its cutting edge or working edge, cleavers can be classified as cleavers with straight cutting edge, cleaver with convex cutting edge and cleaver with round cutting edge. The butt end of cleaver would be invariable whether "U" shaped or "V" shaped. Cleavers are distinguished from handaxes on the basis of their working edges. In case of handaxe it is highly pointed or semi-pointed and this is mainly due to the intersection of two lateral margins which in case of cleaver, the working area is broad and maximum and this is mainly due to the removal of flakes from both the dorsal and ventral surfaces.

**Handaxe** : The most distinctive characters of handaxes are its shapes which are always the derivatives of oval forms. The anterior end is pointed or semi-pointed
due to intersection of the two lateral margins. Handaxes and made either on pebble or core or flake. On the basis of its morphological characters handaxes are classified into a number of sub-types.

From the simple flakes to the unifacial choppers and from the choppers to the bifacial chopping tools, we find a spontaneous technical progress in tool making. From the phase of bifacial tools to the Acheulian handaxes was a further step forward. For example an appropriate piece of stone in which the man's mind had already foreseen the shape of the equipment to be made out. It further required trimming by using the minimum number of strokes. A new technique of working on it longitudinal, was used, to give the equipment its prefinal form. Use was made of wooden hammering device which in itself is a new instrument for longitudinal trimming of the borders. It appears far more superior technically as compared with that found in the earlier stages.

These developed procedures led to economy in the use of raw material. The earlier prehistoric inhabitants knowing only the flake or biface technique, could made out only a rude ragged cutting border of two to four
inches long. But the later inhabitant knowing the techniques of making Acheulian handaxes could make two tools each with a good cutting border more than six to eight inches long. On the other hand Levalloisian technique further proved the quality of the flake tools and shows more economical in the use of raw material. Important sites from where these tools have been discovered are as follows: Valleys of Sirsa, Beas and Banganga in East Punjab, Singrauli basin and Yamuna valley in Uttar Pradesh, Roro valley in Bihar, Kangsabati and Gandheswari valley in West Bengal, Burhabalang valley in Orissa, Bhavanasi, Krishna valley, Nagarjunakonda in Andhra Pradesh, Karttalaiya valley in Madras, Malaprabha and Ghataprabha basins in Mysore, Godavari basin in Maharashtra, Sabarmati and Mahi valley in Guzarat, Narmada valley in Madhya Pradesh, Chambal basin in Malwa Banas, Ganbhini and Luni valleys in Rajputana. Except Sindh and Kerala, these tools have been discovered from all parts of India.

The sub-types are Almond, Pear, Ovate Pyriform, Cordate, Triangular, Sub-triangular Laneeolate etc. In India, there is hardly any Palaeolithic site where this specific type did not occur. Handaxes are believed to be
all purpose tool, but its specific function may be ascribed
do gigging - digging edible roots and nuts. During the
early part of Acheulian culture handaxes were crude and
massive with bold flake scars and sinuous profile. But
towards the closing part, it became neater, finer and
better with uniform flake scars and straight profile.
Ovate and Laneolate types belong to this category.

The next phase of cultural evaluation in India is
known as Middle Palaeolithic culture characterised by the
deployment of flakes in large number and Levalloisine
technology. The industry of this cultural phase is better
known as flake industry. The major tool types are scraper,
point and borer etc. It is mainly due to persistent
effort of Prof. H.D. Sankalia that the Middle Palaeo-
litic culture has been established as a distinct cultural
phase. Middle Palaeolithic industry has been reported from
different parts of India. Rajaguru has reported it from
Chirki on Pravara river near Nevasa. Sankalia reported
it from Nevasa while Misra found a similar industry from
Luni basin in Rajasthan. Mahapatra reported a distinct
middle Palaeolithic industry from Orissa while Ghosh has
reported it from West Bengal and Singhbhum. Dani has
reported this industry from Sanghoni Cave. From Uttar
Pradesh and Madhya Pradesh this industry has been reported
by a number of scholars including Krishnaswami and Saundarajan, Joshi, Khatri, Singh, Jayswal, Ahmed, Sankalia etc. From Gujrat this industry has been reported by Sankalia. From South India, this industry has been reported by Pappu, Paddayya, Jssac, Murty, Misra, Cammiade and Burkitt etc.

This is relatively smaller in size than the above-mentioned types. Its shape varies from rectangular to square and triangular to oval. The working edge may be formed either by unifacial or bifacial workings.

Scrapers: These were, perhaps, used for scraping things like tree-barks, wood, animal hides etc. According to the form of the particular artifacts and the position and nature of the border for scraping, it has been further named as side-side-scraper, end-scraper, round-scraper, hollow, concave or convex scraper.

Borer-cum-scraper: This tool is also characteristic of the Middle Palaeolithic culture. In this the projecting borer and as well as the adjoining cavities are retouched. These tools serve as protective for the purpose to be bored and for the artifact itself and provide a suitable handhold.
Points: These tools have been found in different shapes and forms e.g., large or small, thick or thin, triangular or quasi-triangular—some of these with an artistic finish. This can be used as arrow-heads while the large and thinner sizes with a mid-ridge as spear heads etc.

Borers or Awls: These artifacts have either a little or large thick projecting point which is carefully retouched. The physical structure of these artifacts possess various shapes.

Burins: These are small chisel-like tool on a blade-like flakes, having a sharp but thick-set cutting border, formed by the intersection of the bevelled or sloping surfaces.

Upper Palaeolithic culture: The term Upper Palaeolithic has been a recent addition in the Indian stone age culture. Earlier it was held that there was not much evidences for distinguishing Upper Palaeolithic in Indian stone age sequence. But recent discoveries of artifacts based on blade tool technology and occurring between Middle Palaeolithic and Mesolithic contexts in different parts
India, as well the discovery of bone tool industry from Kurnool cave supplemented by radio carbon datings favour the recognition of Indian Upper Palaeolithic culture. Important discoveries have been made by Sankalia from Pravara basin, by Sharma in Belan valley, Sonndara-rajan from Nagarjunakonda in Andhra, Issac from Kurnool Ghosh from Bihar, Datta from Kattra in West Bengal, Sheshadri from Bijapur in Karnataka and Murty from Chittoor in Andhra etc. The important tool types are various types of blades, scrapers, points, borers, burins, lunates etc. During this period, people largely preferred silica group of materials like Jasper, Chalcedony, Agate etc. The next stage in the culture history of man is known as Mesolithic culture of the Post-Pleistocin period. Microlith is a technical term while Mesolithic denotes a cultural stage. Microliths are the constituent elements of the Mesolithic culture. The blade technology which was introduced during the Upper Palaeolithic culture reached its culminating and fully utilised by the people. Blades were detached from specially prepared cores. A variety of tools occurred in this cultural phase and these were often used as composite tools.
All these above mentioned tools have been found at Navasa on the Pravara in Ahmednagar District, Godavari at the Bel-Pandhari, Surgaon and Kalagoan, around Maheswar on the Narmada in district Nimad and many other sites in M.P., Maharashtra, North Mysore, Andhra, Bundelkhand, Orissa, Western Rajputana, Saurashtra, Madras and in Sind at Sukkur. Form and shape of these stone artifacts, far different from that of the previous stage, indicates that the prehistoric man of this stage prayed and collected his necessary food in ways different from the ones adopted by the earlier inhabitant. They hunted with a spear and perhaps with a blow also, as the tanged points indicate. The evidence of hollow scraper might have been suggested that it was used for piercing the skins of animals etc.

The next stage in the technological development of man occurred following the four glacial periods. In this period man made small specialized parts of the tools and fixed these parts together for whatever function he desired. The microliths, the small parts of the composite tools, were made in different shapes geometrical as well as non-geometrical as follows:
Cores: Generally, cores may be divided into three categories: (a) Pointed or conical, (b) Flat-based and (c) Chisel or oblique ended. These cores measure one half to two and one half inches in length.

Blades: The term 'blade' means a long narrow flake with about parallel sides move out of a core. This is thin and flat compared with its length. This have plain or faceted striking platform. Blades are often retouched and this retouchment distinguished it from other thing of stone artifact. These retouched blades are either (a) Single straight-sided, (b) double straight-sided, (c) Straight but pointed at one end; or (d) Straight with one end curved.

Lunates or Crescents: These are very little microliths and have the shape of a crescent moon. Virtually this are being thickened and blunted for halting and the straight side being retouched.

Triangle: Having both regular and irregular in shape, the largest side is blunted and the opposite angle and sides are retouched.
Trapeze: The two horizontal parallel sides are untouched but the two non-parallel sides are finely retouched. These upper palaeolithic tools are sometimes straight and sometimes concave and also longer or shorter than the parallel sides.

Trapezoid: These are quadrilateral in shape with two sides parallel. Both sides of such a microlithic form are found blunted that is why it is called trapezoid. The above mentioned microliths have been discovered from many sides of India e.g., Birkhanpur on the bank of the Damodar river in district Burdwan of West Bengal, Singrauli basin in eastern Uttar Pradesh Mayurbhanj, Keonjhar and Sundergarh in Orissa, Tinnevelly in Andhra Pradesh, Chitaldurg and Bellary in Mysore, Langhnaj in Guzarat and Rajputana in Madhyapradesh. Except Assam, Kerala and Punjab Microliths have been found all over India. In this period the inhabitant belonged to the food gathering stage though they were more developed in their techniques of making microliths than the people of earlier stages.


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