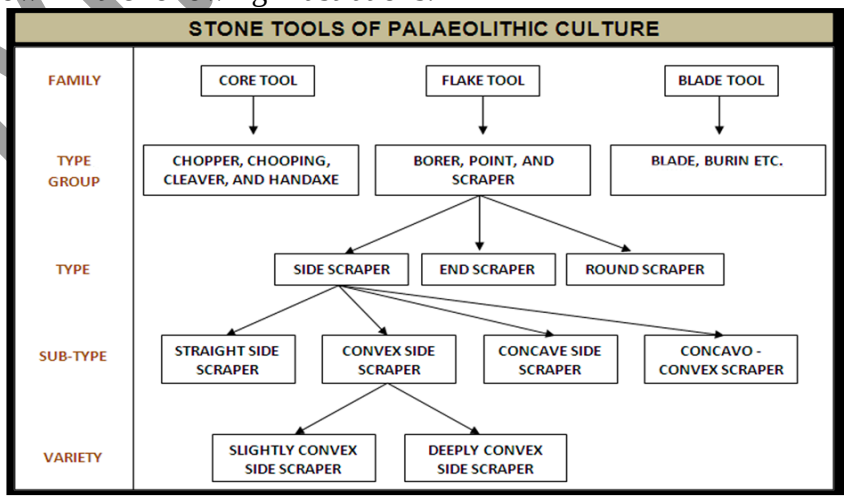
SECOND SEMESTER (HONS)
PAPER: C3T

LITHIC TOOL TYPOLOGY & FUNCTION

Tool Typology:

Prehistoric archaeology is a study of mainly stone and bone tools though it has occasionally to deal with other artifacts as well. These tools are being the remains of the non-living culture; archaeologists have to coin some names mostly on the form and technique as well as the likely function of the tools. The content of the present module is confined to the stone tool typology – particularly its concept and classification along with stone tool types and their functions.

Typology is the method the archaeologist uses to arrange the artifacts in a scheme to show gradual development or degeneration through time. It is frequently assumed that artifact-types are self-evident groups of artifacts intended for a specific usage, for example, projectile points, axes, burins, scrapers, etc. Artifact-types are conceived in terms of detailed sets of similarities between numbers of artifacts such that the degree of similarity between artifacts within the type group is greater than any similarity between the artifacts in separate type groups. Therefore, the defining type groups are those separate populations of artifacts respectively carrying attributes in neat, rigid, mutually exclusive artifacts clusters. Further, within the type-group archaeologist can subdivide until the smallest indivisible unit according to the artifact attributes. For example, the Stone Tool Family of the Palaeolithic culture can be grouped into three family groups – Core Tool, Flake Tool and Blade Tool. Each of these families can be divided into a number of type-groups; like chopper, chopping, and handaxe *etc.*, under core tool; cleaver scraper *etc.* under flake tool; and blade and burin under blade tool. Similarly the type group is divided into types. For instance the type group scraper is divided into three types of scrapers. They are: side scraper, end scraper, and round scraper. Likewise these types are again divided into sub-types, *e.g.* the side scraper is divided into four sub-types: straight side scraper, convex side scraper, concave side scraper, and concavo-convex side scraper. Moreover, the sub-type is also again divided into varieties. For instance the sub-type convex side scraper has two varieties. They are the slightly concave side scraper and deeply concave side scraper. These sub-divisions are shown in the following illustrations.



In Palaeolithic stage, stone tools were manufactured mainly. There are two broad categories of tools-

(i) Core Tools and
(ii) Flake Tools

A core tool is one which is made by knocking off flakes from a nodule of flint until it becomes of requisite shape in contrast to a flake tool which is fashioned from a flake struck off from the original nodule. Predominance of core tool is found in the Lower Palaeolithic stage in which Handaxe, Cleaver, Chopper are included.

In the middle Palaeolithic stage, the core tools sharply declined and instead flake tools flourished. The flake tools may have the following characteristics on their ventral surfaces:

i) A striking platform
ii) A positive bulb of percussion
iii) Main flake surface

The flake tools include Scraper, Point, Blade. The emphasis on stone tool manufacturing had been sharply reduced during upper Palaeolithic stage when tools were mainly prepared on bone and antler primarily of reindeer. Baton-de-Commandement or arrow strengtheners, lance points, bone needles, harpoon heads, dart-throwers were the most important bone tools manufactured during the upper palaeolithic stage. Better workmanship is observed in stone tool manufacturing in this period as evidenced from the production of leaf-shaped points (both Laurel and Willow leaf-shaped points), small blades, burins or gravers made on flint. Pressure-flaking was employed for the first time and characteristic channeling of the margin is observed in flake blades and buring. The famous home-art and cave-art are attributed to the creative merit of Cromagnon race who were supposed to be the creators of Upper Palaeolithic culture.

(i) Core Tools:

Various core tools are discussed below:

a. Rostro-Carinate: in this type of core tool, the original pebbly cortex has been retained on its ventral surface as well as on the dorsal surface near the butt end. Only the working end of the dorsal surface has been worked by means of a few deep primary flaking. In profile, it appears to have 'eagle's beak like projection towards the effective end.

b. Proto-Handaxe: It may be considered as a variety of Rostro-carinate. It is comparatively better worked the flaking are more wide spread, though they are mostly of primary nature. Secondary flaking are absent or rare. Pebbly cortex is significantly present, mainly on the dorsal surface.

***c. Handaxe*:** It is generally a bifacial core tool appeared during Pre-Chellean, Chellean or Abbevillian and Acheulian stages of the lower palaeolithic culture. A handaxe possesses a thick, rounded butt end and a sharp, pointed working end formed by the intersection of two converging lateral margins and the primary flakes of both the surfaces towards the effective end.

***d. Chopper*:** It is a unifacial pebble tool in which two or more deep flake-scars might be noticed in such a way so as to produce a broad, irregular but sharp cutting edge. The butt end is blunt and rounded. Pebbly cortex is significantly present in either or both the surfaces.

***e. Cleaver*:** It may be considered as a tool within handaxe family of tools with broad, transverse cutting edge and a heavy tapering gripping end. The working end has become more or less sharp by the intersection of two flat flake-scars from both the surfaces. A cleaver has invariably diverging lateral margin and a rectangular cross-section.

f. Disc Core: A kind disc-shaped core has been unearthened from which number small broad flakes have been detached. The cross-section may be triangular or bipolar.

g. Tortoise Core: This type of small core has a shape of a tortoise lying on the ground. From this, it is supposed a number of long, narrow flakes have been removed. It could used as a scraper too.

(ii) Flake Tools:

The flake tools are:

***a. Scraper*:** It is basically a flake tool. In size, it is invariably small, with convex working end. Some concave scrapers have been reportedly found in India and Europe. Scrapers are of different shapes and sizes, such as side-scraper, end-scraper, keeled scraper, core scraper, noose scraper, round scraper and the like. Step like retouchments or secondary trimmings are located near the margin of both surfaces.

***b. Points*:** These flake tools may be considered as the miniature form of handaxe with the working end more sharp and pointed. These were no doubt used as the points of lances, darts or other hunting missiles. Points also exhibit a large varieties namely proto-mousterian points, Mousterian points, single shoulder points, double shouldered points, laurel and willow leaf points.

c. Knife Blade: A knife blade is characterized by two long, parallel sides, one of which is sharp while the other one in blunt by abrupt trimmings so as to form the characteristic channeling of the margin. There are a few varieties of this type of tools like Audi knife blade, chatelperron knife blade and Gravette knife blade. They appeared during upper palaeolithic phase.

***d. Awl*:** Any suitably pointed piece of stone might serve the purpose of an awl to bore something.

Stone Tool Types and their Functions:

The prehistoric Stone Age, based on the typo-technology of the tools, is divisible into Palaeolithic, Mesolithic and Neolithic cultures. The characteristic stone tool type groups of the Palaeolithic culture are 1. Handaxe, 2. Chopper, 3. Chopping tool, 4. Cleaver, 5. Pick, 6. Scraper, 7. Borer, 8. Point, 9. Blade, and 10. Burin or Graver.

A. Palaeolithic Stone tool:

The Palaeolithic stone tools are made on core or flake or blade, and these are also identified respectively as core tool, flake tool and blade tool.

***1. Chopper*:**

Chopper is a pebble tool with unifacially flaked broad cutting edge and thick pebble butt. It could have been used in cutting of wood with the broad edge and with the thick butt end smashing or cracking of the animal bone for marrow and the hard shell nuts.

2. Chopping tool:

Chopping tool is also a pebble tool with bifacially flaked at one end to produce the bread cutting edge and a thick pebble butt. It could be used in the same way as the chopper.

3. Handaxe*:*

It is a bifacial tool. Handaxe types are distinguished according to shape and technique as :

1. Pear-shaped,
2. Lanceolate,
3. Triangle,
4. Cordate,
5. Ovate,and

6. Micoquian

Handaxe is considered as all purpose tool, such as digging up roots, cutting and smashing of killed animal and boring the hide or animal skin. They are also collectively known as coup-de-poing or multipurpose tool. Hence the thin elongated handaxes like lanceolate could have been served as spear-heads after being hafted in wood or bamboo shaft. While the ovate type of handaxe with sharp edge all around could be used as disc or disc-like purposes for hurling against an enemy (human or animal).

4. Cleaver :

Cleaver is a bifacial tool made on either a core or a massif flake; generally, it has a broad edge produced by the intersection of a primary flake surface with one or more flake scars on the other surface. Various types of cleavers can be distinguished according to the shape or form of the butt, cutting edge and the cross-section. There are cleavers with,

1. Square or rounded U-shaped butt and square or rectangular body,
2. Pointed butt and straight, broad edge and roughly triangular in shape,
3. Broad or narrow butt and flaring sides, and 4. Parallelogrammatic section.

Cleavers are used primarily in cutting or chopping or cleaving purposes like dressing the animals for meat, splitting the trunks of tree and carcasses of animals, *etc*. Sankalia has suggested that a cleaver with trimmed long sides might be used after hafting to a handle.

5. Pick:

Pick is a heavy pointed tool. It is distinguished from the handaxes by its massive cross-section and elongated pointed edge. This tool could be used in digging roots.

6. Scraper:

Scraper is mostly made on flake or blade, and sometimes on worked out core, for scraping the skin of animal, thin wooden or bamboo shafts, *etc*. According to the position and nature of working edge, it is classified into Side scraper, End scraper, Keeled scraper, Nosed scraper, Round scraper, and Core scraper. The Side scraper is a tool made on a broad flake with the edge at one of the sides. It can be further sub-divided according to the nature of the scraping edge as Straight-side scraper, Convex-side scraper, Hollow-side scraper. The straight and convex side scrapers might be used in scraping by pushing the edge both forwards and backwards over the skin. The hollow or concave side scraper might be used for scraping away excess material on a spear shaft or bone artifacts in spoke-shave fashion. The end scrapers are generally made on blades, and the working edge is produced by fluting retouches on the dorsal at one of the ends. The end scraper might be used by holding the ventral side facing upward with the scraping motion towards the user. The Round scraper is named after the presence of the scraping edge all around the flake, when the tool is very small it is also termed as thumbnail scraper. This type of scraper is used for finer work and as small whittling knife.

7. Borer or Awl:

Borer or Awl is a tool made on either a flake or nodule by making deep notches one on each side to form a narrow projecting edge that is being sharpen by careful and minute retouches. It is a tool used in piercing or drilling holes for providing fastening attachments of the skin cloth.

8. Point:

Point is made on either flake or blade, and its main character is the very thin narrow pointed edge produced by careful secondary retouching. Points are used as the tips of the spears or arrows forming parts of composite tools. According to the form, point can be classified into triangular point, leaf-shaped point, tanged or shouldered point.Triangular points are one of the typical tool types of the Mousterian industries and also known as Mousterian point. It is made on a flake with careful retouching on both or one of the sides. According to **P.K. Oakley**, it could be used as a knife also. **Leaf-shaped point (Willow-leaf/Laurel-leaf point):** Leaf-shaped point is made on a flake and generally range in size from 2" to 8" and are often bifacially worked, thin in section, sometimes with one end more pointed than the other. Fine retouching is done by

employing pressure flaking technique either on one surface or on both surfaces. This type of stone tool is the characteristic tool of the Solutrean industry of the Upper Palaeolithic Culture and might be used as arrow-heads and javelin-heads.

Tanged or shouldered point is made on flake or blade and characterized by the presence of an elongated projection at the base opposite to the pointed edge for the purpose of hafting. The tang is produced by notching at the base on one side or both sides. This type of tool could be used as arrowhead. According to Coles and Higgs, some of the shouldered points have been shown to be cutting and ripping knives.

9. Blade:

Blade is a long and thin parallel-sided flake having one or more midridges on the dorsal. Bldaes could be divided into narrow blades and broad blades based on the number of midridges. According to the nature of the retouching at one of the sides the blades of Upper Palaeolithic Culture can be classified as (a) chatelperronian knife blade, (b) gravettian knife blade and (c) trapezoid blade. The chatelperronian knife blade has one razor-like straight edge, and the other curved over to the point and blunted by abrupt trimming for handholding. In the gravettian knife blade the blunted back tappers gradually to meet the blade at a point, while the trapezoid blade has one blunted back and obliquely retouches at both ends. Blades could be used in cutting purposes as knife.

10. Burin or Graver:

Burin or Graver is a tool with a narrow chisel edge made on either a flake or blade. It is the typical tool of the Upper Palaeolithic Culture. A great variety of burin has been recognized by the prehistorians, but the most common type is called 'burin bec-de-flute'. This type is characterized by the presence of one burin facet on each side of the working edge. There are also burins with gouge and beaked edged gravers. In these two cases more than one curved graver facets meet with a concave flake scar to form a gouge edge or with a flat plain flake scar to form a nose like beaked edge.

B. Mesolithic Stone Tools:

Mesolithic culture is considered by some prehistorians as an 'extension of palaeolithic' or the Epi-Palaeolithic stage. Tools grew smaller and smaller in s size (microliths). The earliest domestication of animals (dog), earliest pottery (sun-baked), invention of bow are some of the characteristics of this stage. The use of hafts, slot of bone or of wood could be traced. The tiny microliths were no doubt hafted in row or in series before using. It is characterized by the making of microliths that could be used as composite tool. Neolithic stone tools have generally smooth surfaces due to the grinding and polishing technique employed in making the tools. The representative neolithic tool type groups are 1. ***Neolithic celt, 2. Chisel, 3. Ring-stone, and 4. Quern.***

The microliths are very small blade tools, because of its smallness in size not a single microlith could be used as an effective tool, but used as composite tool after fixing them to a shaft or handle. Microliths have two broad categories as geometric and non-geometric microliths. The common types of the geometric microliths are Triangle, Trapeze and Lunate (Crescent). In the non-geometric group, such regular geometric forms are absent. These microliths could be used as barbs of harpoon or sickle blade after hafting to a handle.

C. Neolithic Stone Tools:

In Neolithic stage, we could mark a cultural revolution. In the preceding cultures men were total parasities on nature. They were satisfied with whatever nature offered them. During the Neolithic stage, man became controller of nature. The domestication of plants and animals led man to command nature. Wheat, berley, rye were almost the first cultivated crops. Pigs, goat, sheep, cattle besides the dog were some of the useful animals first domesticated by man. True pottery (fire-baked), spinning and weaving were the important innovations of the Neolithic stage.

Polished and ground celts, ring-stones, hammer-stones and other smooth and polished tools bear the evidence of relatively higher technological skill of Neolithic man. These tools were also hafted. The nomadic food-gathering habit transformed into sedentary, settled agro-based economy which led to ultimate formation of village. Class oriented society gradually grew mainly due to surplus economy of Neolithic men. Megalithic memorial tombs afford evidences of higher social order.

The Neolithic Stone tools are generally identified by the presence of smooth ground and polished tool surfaces. These tools could be divided into celt, chisel, ring-stone and quern. The Neolithic celt, according to Sankalia (1964:83), is believed to be founded on a false reading in a vulgate, and applied to the ground axe or adze type of Neolithic stone tools. The Neolithic celt can be broadly divided into axe and adze. The division of axe and adze is based on the preparation of the working edge. In case of the axe the edge is present medially due to symmetrical bifacial grinding, while the laterally beveled edge is the character of the adze type of celt. Both the types of celt are used after hafting to a handle with its blade parallel to the axis of the handle in the case of axe, and at right angle in case of adze.

1. ***Tanged or Shouldered celt****:*

The chief feature of this type of celt is the prolongation of the butt end into a tenon to provide a suitable haft. Two varieties of this type of celt could be divided based on the nature of the tenon as simple shouldered celt and rectilinear shouldered celt. The rectilinear shouldered celt has square cut tenon and body, while the simple shouldered celt has only the curved sides to form the tenon. It could be used generally as adze wise.

2. ***Chisel****:*

Chisel is a narrow cylindrical or rectangular stone tool with two of its sides tapering half way to form the working edge, and opposite to this edge the butt is generally thick for suitable hammering. The edge may be either medial or lateral. Chisel could have been used in cutting across the fiber of the wood in the carpentry works, like making of the canoes.

3. ***Ring-stones:***

Ring-stones are generally thick and round shaped stones with a hole at the centre. Ring-stones seem to have been used as weights for digging sticks in the primitive agriculture. It is also suggested to have been served as mace-heads.

4. ***Querns:***

Querns are comparatively large stone slabs with flattish or concave surfaces. These are found in the habitational sites of the Neolithic Culture and later period. These stone slabs were used for crushing and grinding or milling grains.

D. Metal Age Tools:

Then came the metal ages like- Bronze, Copper and Iron ages were not of uniform dimensions everywhere in this world. At the initial stage, both stone and metal implements were produced namely in the Chalcolithic stage. Gradually, the stone implements faded out to give place to metal implements. With the growing ideas about metallurgy, men tried to cultivate new things. Writing on paper started gradually. Towns and cities were established. Science and technology could sign sufficient ground and so also art, music and literature. The metal ages mark the beginnings of historic period and of modern cultural phase.

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