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Module : 28 Tool types and techniques of Mesolithic culture

Development Team

Principal Investigator	Prof. Anup Kumar Kapoor Department of Anthropology, University of Delhi
Paper Coordinator	Dr. M. K. Singh Department of Anthropology, University of Delhi
Content Writer	Dr. M. Manibabu Singh Department of Anthropology, Manipur University
Content Reviewer	Prof. Falguni Chakraborty Department of Anthropology, Midnapur University

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INTRODUCTION

The Mesolithic cultural period succeeds the Palaeolithic and occupies temporally the earliest part of Holocene which began with the end of the last glacial period over 10,000 years ago. The dividing line between the Palaeolithic and the Mesolithic is assigned, however, with either with geo-palaeontological or cultural changes in different parts of the world. In northern, central and other parts of Europe, the line is drawn after the Ahrensburg or its contemporary culture, that is, after the Younger Dryas which coincides with the conventionally accepted end of the Ice Age. In southwestern Europe (in France) onset of the Azilian is taken as the beginning of Epi-palaeolithic or early Mesolithic. The Mesolithic was a period of massive readjustments to the environmental changes at the end of the last ice age. As the tundra and large animal herds of the Paleolithic disappeared, people adapted to the new, forested habitats and hunting continued its importance. Archaeological significance lies with the fact that man's way of life and his culture were firmly embedded in and influenced by his environment. The new environment led to a crisis among the hunter-gatherer groups: the descendants of the late glacial communities were faced with a difficult choice. Consequently there appeared gradual domestication of plants and animals and the formation of settled communities at various times and places. Another characteristic were hunting and fishing settlements along rivers and on lake shores, where fish and mollusks were abundant. And obviously, new varieties of tools and techniques appeared in order to adapt themselves to the changed ecological conditions associated with the retreat of glaciers, the growth of forests in Europe and deserts in North Africa, and the disappearance of the large game of the Ice Age.

Desmond Clark (1957) made three stages of development of Mesolithic corresponding to geological periods in Europe - such as, the Early Mesolithic (Mesolithic-I) with the *Pre-Boreal* (flourished between 8300-7700 BC), the Middle Mesolithic (Mesolithic-II) with the *Boreal* (flourished between 7700-5500 BC), and the Late Mesolithic (Mesolithic-III) with the first half of the *Atlantic* (flourished between 5500-3000 BC). In the second half of the *Atlantic*, the Ertebölle-Ellerbek culture of the north emerges. It includes certain Neolithic culture elements and may be interpreted as partly Proto-Neolithic. Jochim (2011) however put another approximate geo-chronological dates of these periods, such as 10,300–8700 BP (for Preboreal), 8700–8000 BP (for Boreal), and 8000–5000 BP (Atlantic). Subsequently, a chronological ordering of Mesolithic into 'Early' and 'Later' periods has been done mainly on the basis of typo-technological criteria of lithic artefacts (Jacobi 1973, Mellars 1974, Jochim 2011).Thus the Early Mesolithic is placed between *c.*10, 000–8500 BP and the Later Mesolithic between *c.*8500–5500 BP (Mithen 1999; Wymer 1991).

The post-Pleistocene Mesolithic is especially characterized by development of geometric microliths and, in the north and northwest of Europe also by flint axes. The appearance of bone and antler axes of various forms is remarkable as is also the appearance of canoes.

The Mesolithic culture in Europe comprises a number of industries, given their names after the type-site or after the typical typo-technology of tools found at a particular site or region. Obviously, myriad developments of tool categories and typologies are witnessed, yet the characteristic tool-typology remains 'microliths'. Thus we can see development of some typical tool-types at different Mesolithic industries developed in Western (such as, Azilian, Tardenoisian, Asturian, and Larnian) and Northern (such as, Maglemosian, Kitchen-Midden, Champignian, and Sauveterrian, etc.) parts of Europe.

The followings are the tool types occurred during Mesolithic cultural period.

1. **Microliths** – Microliths refer to those tiny/small stone tools which are retouched intentionally by 'retouch' or 'secondary work', however, 'every tiny core or flake is not necessarily a 'microlith' (Sankalia 1964). On the basis of their general features with formal shapes and designs, microliths are generally classed as geometric and non-geometrics. The first category refers to those having geometric shapes, such as, triangle, lunate (or crescent), trapeze, etc, whereas the latter category lacks such a form.

A. Geometric Microliths:

i. Lunate or Crescent – These usually refer to those having resemblance to a crescent moon and have a thick rounded back arc. A true lunate is supposed to be symmetrical in shape along the shorter axis which is different from an asymmetrical one having pointed at one of the ends (Sankalia 1964:71-72).

ii. Triangle - Those broken microblades, where the steeply blunted longitudinal sides form the steeply blunted base (Sankalia 1964, Rami Reddy 1987).

iii. Trapeze – As the term signifies, a trapeze microlith typologically refers to those having two parallel unretouched horizontal sides and two non-parallel retouched sides.

iv. Trapezoid - These refer to those geometric microliths having the trapezoidal characters, such as 'having no pair of sides parallel in contradistinction to the trapeze' (Clark 1932, c.f.

Sankalia 1964: 72), and it may be taken as 'a sub-type of trapeze in which no two parallel sides can be seen while the other longitudinal sides are retouched' (Rami Reddy 1987).

v. Transverse arrow head - This tool-type 'belonging either 'to trapeze or trapezoid family" (Sankalia 1964) is a flake with steeply blunted sides, where 'the length between the cutting edge and its posterior border is more than that between the lateral sides' (Rami Reddy 1987).

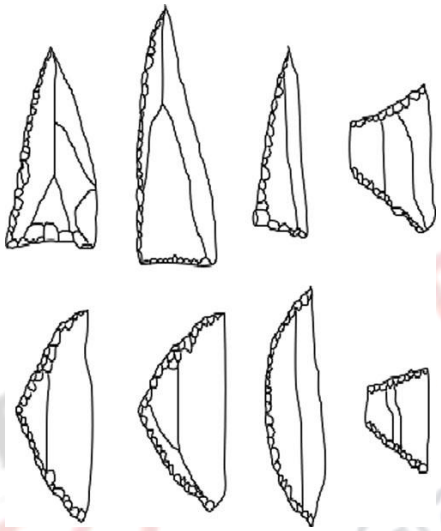

Fig: 1 - Microliths typical of the Mesolithic (from left: points, triangles, lunate, trapezes)

B. **Non-geometric Microliths:**

Tiny tools devoid of any geometric shapes are included under this category. They are often classified according to the type of support (flake, blade), location of retouch (end, side), type of retouch, edge morphology, etc. Under the category of non-geometric microliths - i) truncated blades, ii) backed blades, iii) hollow-based point, iv) oblique blunted blades (or, pen-knife point), v) tranchet, etc, are identified.

i) *Truncated blades*: Blades that are either truncated or trimmed obliquely or transversely so as to get a working edge.

ii) *Backed blades*: These are the blades with one edge blunted by removal of tiny flakes. These are parallel sided blades with one or both of their lateral sides retouched for cutting purposes.

iii) *Hollow- based points*: These refer to those points having a hollow or concave base through retouching, and part of one side is steeply blunted towards getting a pointed end. Such a point

may have a regular triangular form (refer to as *symmetric*) or have one side oblique and the other side straight resembling an obliquely blunted point (*asymmetric*).

iv) *Oblique blunted blades or points*: These are also called pen-knife points (Sankalia 1964). Made either with a small flake or a narrow blade, these have an obliquely blunted retouch side.

v) *Tranchets***:** These refer to small flake tools having single straight cutting edge intersected by two or more flakes removed from the two surfaces.

2. **Microburin:** Microburins are flakes or blades from which at least one spall has been removed to produce a thick chisel-like end and 'one side of the pointed end is the result of a vertical blow or action ... whereas the other side is made by deliberate notch' (Sankalia 1964: 76). These are best identified by the negative bulb and fracture marks left by the burin spall on the burin facet (Berridge and Roberts 1986). Many are of the opinion that the microburin is a production discard of microlithic tools (Breuil and Zbyszewsky 1947, Brezillon 1968, Peresani and Miolo. 2011) and residuals of triangular microlith production (Krukowski 1914).

3. **Scrapers:** Scrapers on tiny flakes are reported to occur in the Mesolithic horizon also and their sub-forms can be identified according to the placement and type of retouch, and edge morphology. Some of the important forms include – side, round (thumb-nail), end, concave, etc.

A *side scraper* made on a piece of flake, can be identified by the presence of intentionally retouched scraping edge along a lateral side, the opposite of which has a thick blunt side.

4. **Microblades:** Microblades or bladelets are simply small, thin flakes having the characters of a blade, such as the presence of midridge and sharp parallel edge. Preferably maximum width of a microblade is 12 mm. The maximum acceptable width for a bladelet is the minimum width of a blade.

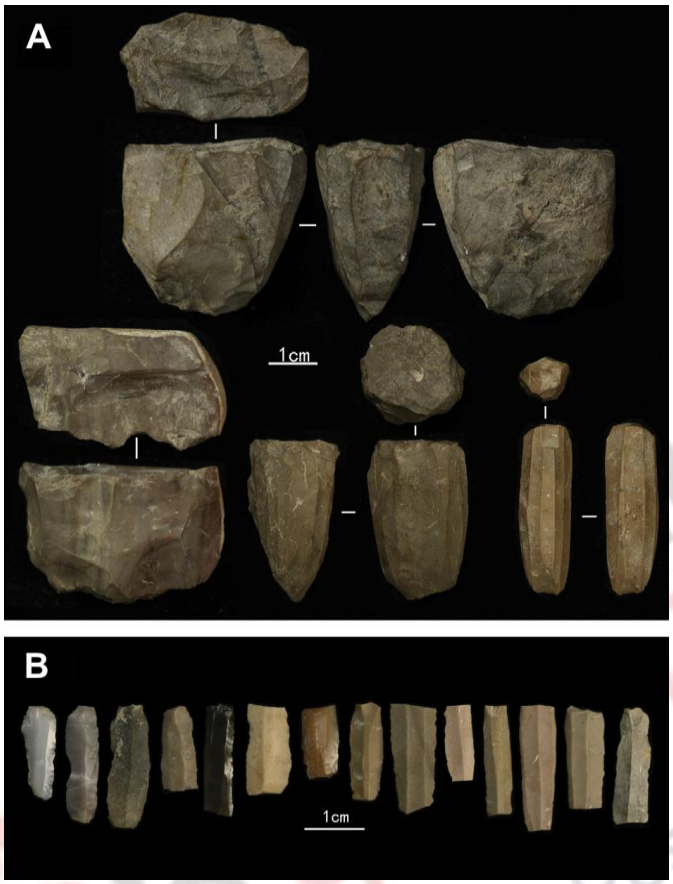

Fig: 2 - Microblade cores and preforms (A), and microblades (B)

5. **Micro denticulates:** These refer to microblades with serrations along one edge in the form of a small saw. It has been proposed that these tools were used to process plant fibres or cut meat. They are most often found on Early Mesolithic sites.

6. **Axes and Adzes:** Axes and adzes of Mesolithic type are known from a number of localities. A characteristic feature of Mesolithic axes/adzes is the transverse removal of a tranchet flake from one face of the tip to form a sharp cutting edge (Berridge and A. Roberts 1986).

7. **Cores:** It is a regular phenomenon to occur micro-core in many Mesolithic sites, which may be either flake- or blade-cores. Flake cores usually lack facetted platforms which are struck off from various points of the cores. Blade core obviously possesses facetted platforms from which thin, narrow, parallel sided blades are removed.

8. **Bone and Antler tools:** Axes and adzes - Bone axes and adzes were made out of antler (of red deer) and these have sharp edges and smooth inner surface of the perforation. Rough shaft-hole is common to almost all the antler adzes.

9. **Barbed bone point**: with a straight form and a row of fine barbs along one side, with the exception of the tip. The fine barbs are formed by means of small incisions, probably made with a sharp flint blade or flake or perhaps a burin.

10. **Knifes and Chisels**: Knifes and chisel blades are made out of the big tusks of the lower jaw of the wild boar at all important Maglemose settlements (Broholm 1924, Friis Johansen 1918, Mathiassen 1943, I948, Sarauw 1903); in the Ertebolle sites (Sarauw 1903), Moreover there are also evidences of frontal enamel of a beaver incisor, antler sleeve (Friis Johansen 1919) as the raw material for making these tools.

MESOLITHIC TECHNOLOGY

Some of the important Mesolithic tool making techniques is given below.

I. Stone tool technology:

Microburin technique - This technique involved the notching of a blade by retouch, snapping the blade at the notch, and further retouching one of the segments to create the desired shape. Usually, microburin production requires selecting a small lithic implement (flake, blade or bladelet), placing it over the edge of an anvil of the desired shape, and applying percussion or pressure on the side of the implement in order to produce a progressively deeper notch until the blank portion beyond the anvil edge fractures, following the direction of the ridge (Peresani and Miolo 2011). This operation produces two pieces: the original blank bearing a portion of the notch and the *piquant-trièdre,* and the microburin that shows the negative of the *piquant-trièdre* adjacent to the rest of the notch (Tixier *et al.*, 1980). The purpose of the microburin blow, according to Gobert (1955), is to achieve this technical *"piquant-triedre"* morphology. This technique is primarily associated with the production of geometrical microliths, such as triangles, trapezes and crescents. Any prehistorian confronted with such shapes should therefore keep an even sharper lookout for microburins among the knapping products.

This technological category also has other variability, such as “coup de microburin” (Tixier *et al*. 1980) or “microburin blow” (Crabtree 1982, Inizan, et. al. 1999), etc.

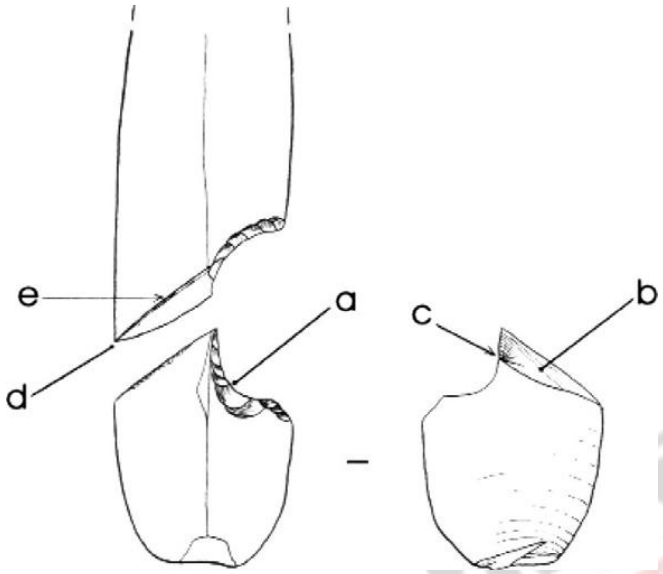

Fig: 3 - Proximal microburin with indication of its morpho-technical elements: (a) notch on the upper face of the bladelet; (b) fracture face on the lower face; (c) impact point of the conchoidal fracture; (d) piquant-trièdre; (e) smoothed edge (Ref: Peresani and Miolo, 2011 - modified after Tixier et al., 1980)

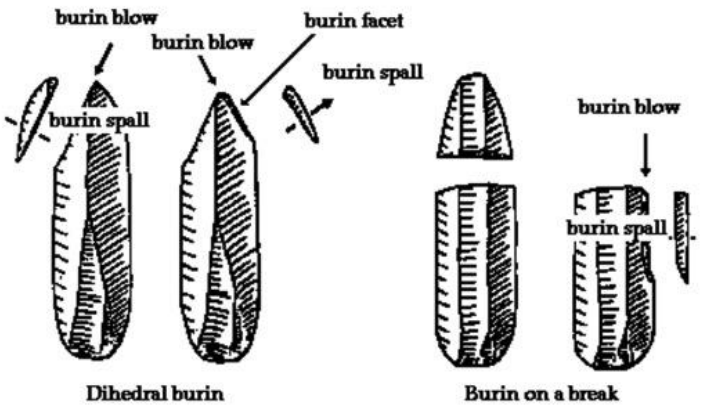

Fig: 4 – Production of burin spall with burin blow, showing burin facets.

Microburin technique – The development of this technology, according to L. Barton, *et. al.* (2007) is out of the bipolar or so-called flake-and-shatter technology that replaced EUP flat-faced core-and-blade technology during the Last Glacial Maximum.

II. Bone tool technology:

Groove and Splinter technique - The bone tools occurred in the Mesolithic horizons, such as, harpoons and points are made with by the application of 'groove and splinter' technique. This technique involves extracting a piece of antler from antler tines which can then be used to make such antler tools. Grooving can either be done with burins or awls; however experimental replication on the Starr Carr grooved antlers suggest that burins cannot have been used for grooving antlers (Anderson, *et. al*. 1981, Mertens 1986). Yet, 'the awls do fit and are far better for grooving than burins in experimental replication of the groove and splinter technique' (Mertens 1986).