DIFFERENT PREHISTOTRIC TOOLS DESCRIPTION

A) Core Tool Types

Following are some of the core tool types.

1. Pebble Tool Types

There are many tools prepared on pebbles. Pebbles are stones, outer surfaces of which are smoothened by running water. Basic pebble tool types are known as choppers.

i) Chopper: These are the earliest tool types made by man. A broad and thick pebble broken transversely to produce cutting edge is called chopper.

Choppers are one of the predominant tool types in Lower Palaeolithic Culture of East Africa. The culture found at Olduvai Gorge in Africa is called *Oldowan* after the name of the site (Leakey, 1966).

ii) 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. Double sided sharp edges and a point are a common form of the chopping tool.

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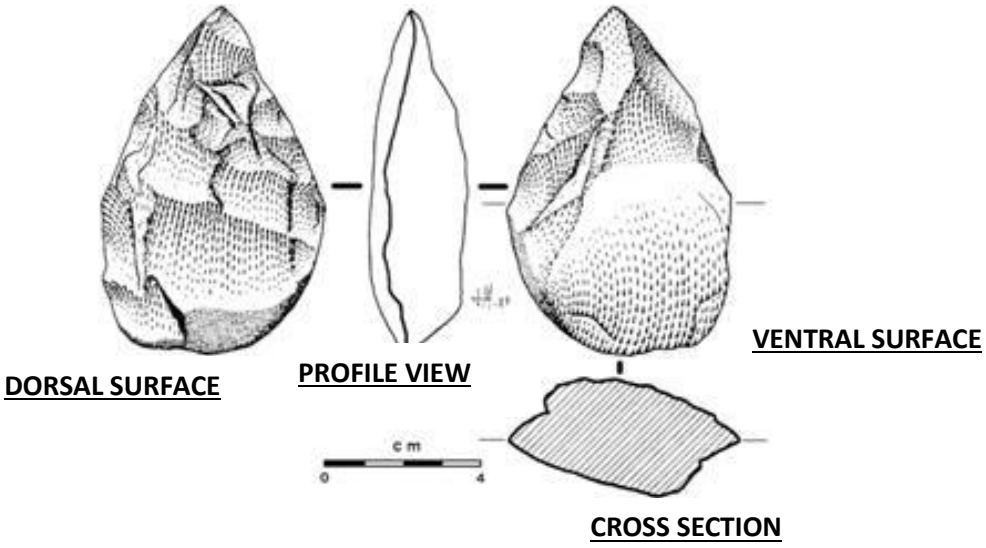
Following are the most common core tool types.

2. Handaxe:

Handaxe is one of the most prolific tool types found all over the world during the entire length of lower Palaeolithic. It is essentially a bifacial tool prepared in such a manner that one end of the specimen is broader and thicker while the other end is narrow. The sharp and the pointed end is considered as anterior end and the opposite end which is often thick and bulbous is called as the butt-end. The working edge is on both the lateral margins and on the anterior end.

When the handaxe is massive and the technique used is block-on-block or stone hammer technique such handaxes are taken to characterize Abbevillian or lower Acheulian tradition (Soressi and Dibble, 2003). With the advent of cylinder hammer technique all the rough edges are regularized and smoothened by careful series of retouchings. According to the shape of the hand axes, they are subdivided into sub-types, namely, almond shaped (Amygdaloid), lance head shaped (Lanceolate) and heart shaped (Cordiform) categories. Some of the middle to Upper Acheulian Handaxes also show a distinct extended S-twist at the lateral or working border. One of the most evolved of these handaxe is an Ovate. This is the tool, where the maximum thickness shifts from the proximal or butt end to the centre. Though handaxes are commonly made on core there are some made on flake. Such hand axes may be distinguished by the presence of main flake surface.

Handaxe is a heavy duty multipurpose tool used in a variety of tasks. They could have been probably used for digging, cutting, scraping and also for butchering and skinning of animals etc.



On the basis of methods of manufacture, handaxes are placed under three traditions: Chellian, Abbevillian and Acheulian based on the evidence found in France. These traditions are indicative of their development through various stages:

i) **Chellian-Abbevillian Handaxe:** These are tools crude in nature and flaked from the upper and lower surfaces. These handaxes are irregular in outline with zig-zag working end. The name is given after type sites, Chelles, located on the junction of rivers Seine and Marne in France; and Abbeville, on Somme River in France. The technique of manufacture was likely block-on-block or stone hammer technique.

ii) **Acheulian Handaxe:** In St Acheul in Somme valley, France, Boucher-de-Perthes discovered very symmetrical handaxes in 1836. Regular in outline, beautiful to look at, these were worked by removing thin flakes from both surfaces. In crosssection, they were biconvex. They could have been produced by a light cylindrical hammer made of wood, bone or stone.

Some types of Acheulian handaxe include the following:

a) Peariform: As the name suggests this is a specific kind of handaxe and resembles the shape of a pear and not just any kind of handaxe which may have a pear-like shape. It is a short heavy handaxe with rather a rounded off point at the working end.

b) Ovate: This is an advanced variety of handaxe which is oval in shape. The tool though biconvex in profile is rather thin and symmetrical. The working end and the lateral borders continue in the form of a ridge across the butt-end.

c) Cordiform: This handaxe is so named because of its similarity with the shape of the heart. The butt-end is well-rounded and curves gently into the sides to meet at the working end.

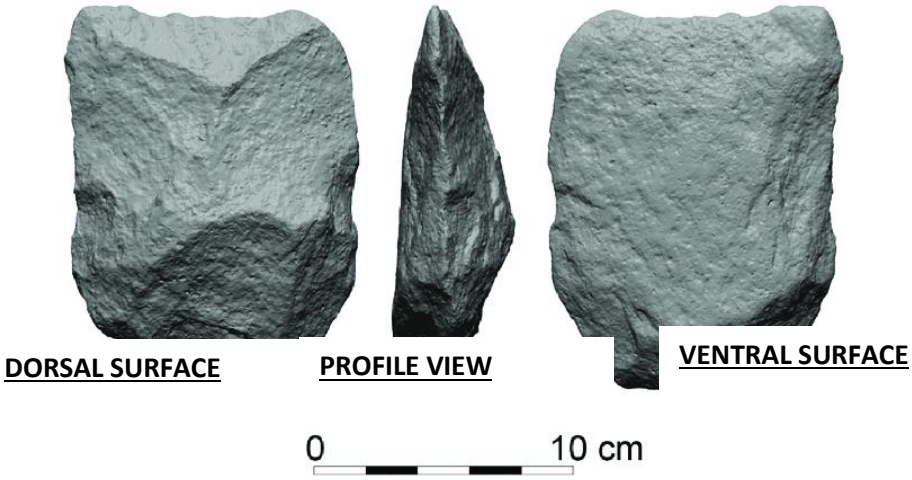
d) Lanceolate: This type of handaxe has fairly long tapering or sloping sides ending in a pointed end, just like a lance head. The surface is found rather flattish as a result of probable well-planned controlled flaking. The width of the tool is always shorter than the length.

iii) **Micoquian Handaxe:** These are small triangular handaxes, with thin elongated working ends. The thick and heavy butt end often preserves the original surface. However unlike Abbevillian it is finely retouched with extensive secondary flaking. They were first

noticed in a French site, La Micoque and follow the Acheulian types stratigraphically. They are not as symmetrical as the Acheulian handaxes.

3. Cleaver:

This is also a biface like a handaxe, with the only difference that working edge is transverse and located on the anterior side. It looks like a modern axe and is supposed to have used for cleaving wood, meat or such other objects. A flat and sloping flake scar is so removed from the anterior end in such a manner that this intersects with scar of detachment of the under surface to give rise to a transverse working end. The lateral borders are worked in such a manner that the cross section of the tool appears like a parallelogram (Sankalia, 1982). The cleavers as a rule have shape like a U or a V. For statistical analysis, as also for computation of proportion of core tools to flake tools, handaxes and cleavers made on flakes are counted within core category (Oakley 1974).



B) Flake Tool Types

A flake can be big when detached from massive cores. But such massive flakes are seldom used to make flake tools. A flake becomes a tool only when it is retouched along one or more borders. The location, form and nature of retouch determines the type of a flake tool.

Here a word of explanation is required for the word “retouching.” A series of nibbling executed in a contiguous manner along a border is called retouching. In the case of Levalloisian flake, the entire dorsal surface will show the centrally directed flake scars removed before the flake was detached from the core.

The predominant flake tool types (i) scraper, (ii) point, (iii) borer and (iv) knife.

1. Scraper

a) Side Scraper

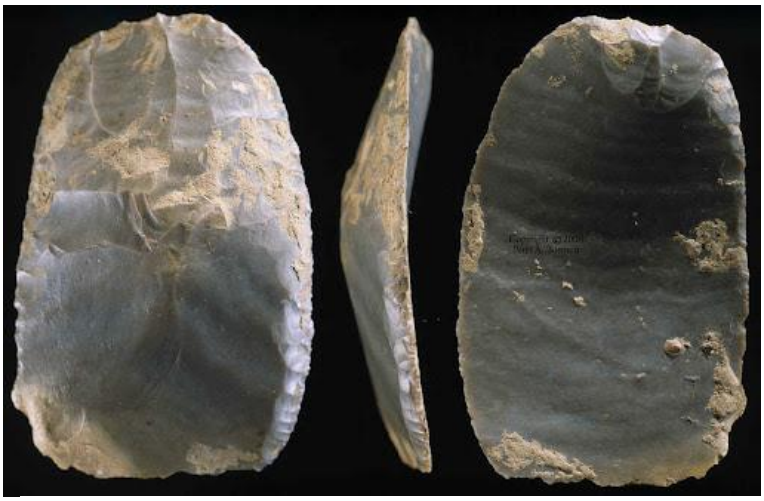
This is the most prolific tool type of the Middle Palaeolithic period. A simple flake is taken and retouching is done along one of its lateral margins. This edge is the working edge used for scraping wood or skin or any such object. The working edge can be convex, concave or straight in outline. Accordingly the side scraper is sub divided. Side scrapers may have both the lateral margins retouched into working edges. These may be called as double edged side scrapers. There may be variation in the form of working edge, namely, convex, concave, straight or notched.

b) End Scraper

In this type the scraping edge is located either on distal or on proximal end. Subtypes are according to the form of working edge that is convex, concave or straight.

c) Discoidal or Round Scraper

This is rounded in shape with working edge aling the periphery.



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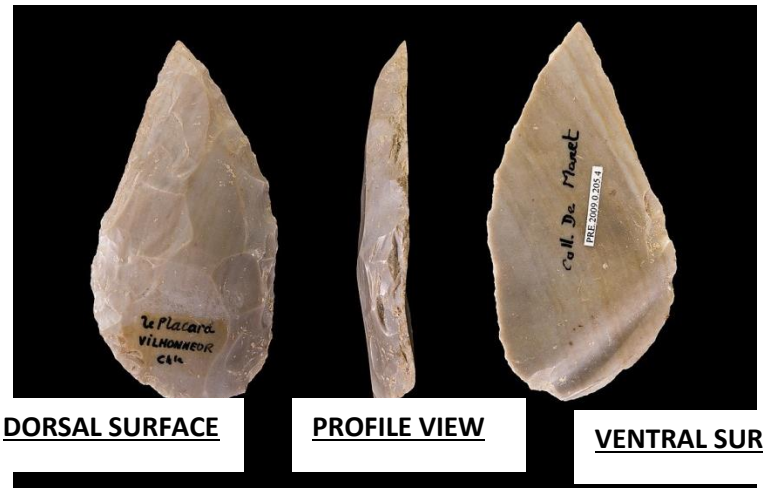
2. Point

Points are almost of the same size as the scrapers i.e., made on medium sized flakes. Unlike scrapers where a general slope is formed from the back border to the scraping border by flaking, there appears a slope of similar kind obtained for two opposite borders. Thus the central region is a little elevated than any of the borders. These two borders converge in the anterior part to give rise to a point. This is further enhanced by secondary retouching near the pointed end. Some special types of points may be grouped as follows: i) Single shouldered point: These are

tools where a single corner towards the base is removed by a single blow. ii) Double shouldered point: Here both corners towards the base appear to have been removed. These are also referred to as tanged points.



3. Borer

These are usually prepared on sturdy flakes. It has a thick projecting point specially obtained by etching out two notches on the two sides of the projection.

4. Knives

This is prepared on a thick elongated flake. One of the lateral borders is thick and is blunted by removing several step flake scars. The other border is sharp and runs along the long axis of the flake. The finished specimen somewhat resembles a modern knife.

C) Blade Tool Types

Blade tools are defined as those flakes which have a length more than or equal to twice its breadth (Tixier, 1963). That is, every blade is essentially a flake but every flake is not a blade. These are usually 8-9 cm in length, 2-3 cm in breadth and 1-2 cm in thickness. The technique of their manufacture is punching, i.e., indirect percussion with an antler used as an intermediate punch.

There are numerous types of tools that are produced on blades during Upper Palaeolithic cultural stage, but the most dominant among these are (i) Blade, (ii) Burins (iii) End Scraper and (iv) Leaf points.

1. Blade

Blades are thin, long, parallel sided flakes which may be retouched or unretouched. In some specialized varieties this retouching occurs in the form of backing or blunting of a border and these are called backed knives.

a) Retouched blades

A retouched blade is a thick blade which is retouched in a semi abrupt manner along the lateral sides.

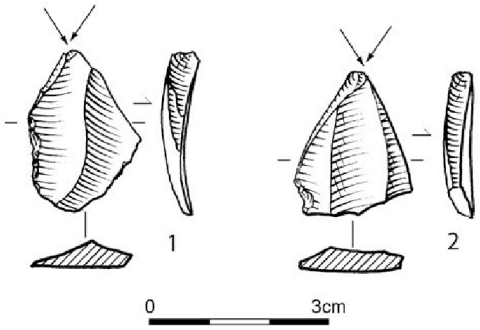
b) Backed Blades

These are blades in which one of the borders of the blade is blunted with the help of steep flaking and the margin parallel to the blunt surface is left sharp.

2. Burins

These are blades in the anterior end of which a screw driver like edge is prepared by the careful removal of two sloping facets. These facets intersect to form the working edge which is equal to the thickness of the blade.

This tool was specifically used for engraving on soft stone or bone as well as on the walls of rock shelters and caves. A typical burin is a blade with margins sliced obliquely at one end so that they meet to form a narrow chisel edge.



3. Leaf Points

This is a very characteristic tool type of Solutrean tradition of French Upper Palaeolithic. Here flat flakes or blades measuring in average 6 cm ×2 cm are given series of scars on both the surfaces by pressure flaking technique. As a result the blades are so reduced in thickness that they tend to be less than 1 cm in thickness. The anterior end is pointed. These look like leaves of certain trees and hence the name. In France these are called *Laurel leaf points*. In slightly later period these leaf points became short and unifacillay worked. These may or may not have a shoulder. These are called *Willow Leaf Points.* However these types are not common in India.

Microlithic

The word means small tools. These are small tools but have got specific typo-technology. These are made on small blade, better known as bladelets. There is a size dimension fixed for designating the status of microliths. It should be within 3cm in length and made by punch and pressure technique (Tixier, 1963). These are so small that nobody can imagine that they could have been used individually by holding them in hand. Further cave paintings as also some evidences from excavated materials have now confirmed that these were used by hafting in combination to produce the ultimate implements to be used (Braidwood, 1948). These are known as composite tools. Microliths appeared in small quantity in the upper Palaeolithic stage but it became the main tool type of Mesolithic culture. People continued to make and use microliths even into the Neolithic stage, with the start of agriculture. Microlithis were hafted in rows on pieces of wood to make sickle or harvesting knife.

Microliths are subdivided into non geometric and geometric types. Those having triangular, trapezoidal and crescent shapes are called geometric types. Microlith not conforming

to any set geometric forms are known as non-geometric types. Following are descriptions of some typical microliths.

A) Geometric Microliths

i) ***Lunates or crescents:*** These are small microliths made on parallel sided blades resembling a half moon. They have a round back (or arc) and a straight opposite side (chord). The arc is thick and intentionally blunted by steep retouch to facilitate hafting in a handle, while the chord remains almost unretouched and sharp.

ii) ***Triangles:*** These are made on broken blades, the sharp edge of which forms the base while the longitudinal sides are blunted. There are two varieties – nongeometric triangular form and a regular form with a longer cutting edge, such as scalene, equilateral and isosceles triangles.

iii) ***Trapezes:*** They resemble geometric trapeze in which the shorter three sides are retouched steeply while the longest side remains as a sharp cutting edge. It may be taken as a transitional form to lunate. In a true trapeze the two parallel sides of the original blade remain unretouched while the non-parallel sides are retouched.

iv) ***Trapezoids:*** These form a sub-type of trapeze in which no two parallel sides can be seen while the other longitudinal sides are retouched.

v) ***Transverse arrowheads:*** In this type the length between the cutting edge and its posterior border is more than that between the lateral sides. It is usually an arrowhead having a transverse sharp edge instead of a pointed one.

B) Non-geometric Microliths

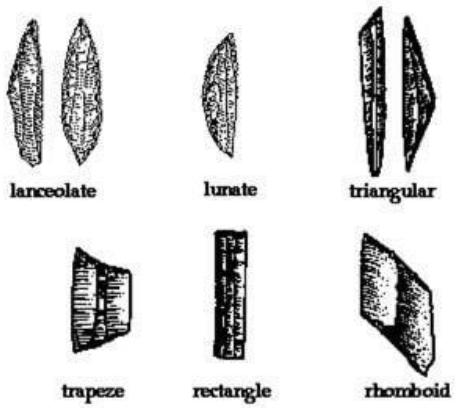
i) ***Backed blades:*** These are parallel sided blades with one or both of their lateral sides retouched for cutting purposes.

ii) ***Obliquely blunted blades:*** These are also called pen knife blades. These possess a steeply blunted side which curves to meet the thin, unretouched edge which acts as a working edge. Partial or complete blunting may be done on right or left side. The working edge could be concave or concavo-convex or straight.

iii) ***Truncated blades:*** These are blades, the broken ends of which are trimmed either transversely or obliquely probably to produce a scraping end. The truncation is done at one or both ends. The working edge is transverse or straight.

iv) ***Tranchets:*** These are flake tools the cutting edge of which is formed by the intersection of two or more flake scars from the two surfaces of the tool.

v) ***Hollow based points:*** In these tools at least a part of one side of the point is steeply blunted while the base is intentionally hollowed by retouch. They include both symmetric and asymmetric types.

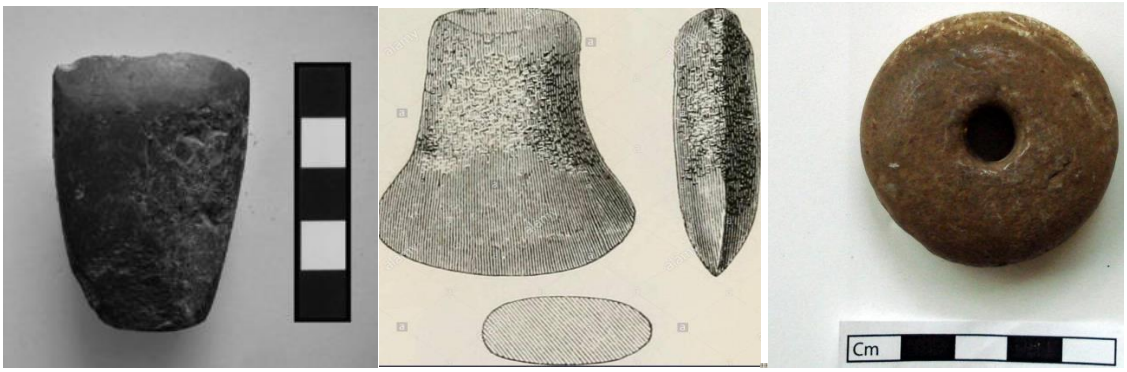


D) Neolithic Tool Types (Celts)

Celt is a generic name and includes such types as *Axes, Adzes, Chisel,* etc. These tools are the most common and diagnostic feature of the Neolithic culture. Following is the description of the Neolithic tool types.

1. **Axes:** These are roughly triangular in form with a firm transverse working edge. The working edge is asymmetrical in profile and is invariably ground and polished. These look similar to the modern axes but without the socket. These were used for chopping wood.
2. **Adze:** Adze shares similar to axes in all general features except these have plano-convex cross section at the working edge. There is asymmetrical beveling at the working edge. These were used as modern adzes for shaping and scraping wood or as hoe for digging the soil for horticulture.
3. **Chisels:** Chisel is narrow rectangular pieces in which the two lateral margins are flat, facetted and square and run parallel to each other. The working edge is transverse. This is meant for chiseling wood.
4. **Ring Stone:** These are circular pieces of stones with a hole in the centre. The hole is usually made by grinding from both the surfaces of the disc, so that the hole thus formed

has a hour glass shaped out line. These could have been used as weight for digging stick or as mace head.



E) Bone Tool

Ancient mans used many kinds of animal bones as raw material for tools. Along with artifacts of stone, shell, and wood, bone implements were an important part of many tool kits. As a raw material, bone is tough and slightly brittle. With only slight modifications, the scapulae (shoulder blades) of bison and elk could be made into hoes, and the ulnae (foreleg bones) of deer could be worked into awls. Other types of tools such as fishhooks required considerable labor to reach their desired form.

Manufacturing Techniques

Softer than most stone and harder than wood, the hardness and resilience of bone made it particularly useful. Fresh bone can be split, broken, and splintered. Relatively fresh bone can be modified in various ways, depending on the form and size of the bone and the type of tool desired.

a) Bone Breaking

The simplest means of modifying bone is by breaking the bone on an anvil with a large hammer stone. This technique was commonly employed to extract nutritious marrow from the bone cavity. Long bones of large animals can be cracked and broken into sharp splinters suitable for immediate use as picks or scrapers or for further modification into awls and other tools. This technique of breaking bones is relatively haphazard, but when coupled with other methods such as grooving or sawing, it can be used to shape more sophisticated tools.

b) Grooving and Splitting

For some delicate bone tools, it is first necessary to score the parent bone. Grooves outlining the intended tool's form are cut through the hard outer bone to the spongy cancellous tissue using stone tools such as sharp pointed gravers and chisel-ended burins. The piece can then be broken free with relative ease and made into an awl or needle. Grooving bone with a modified flake tool can be slow. Soaking the bone in water for a few days can speed up the process by temporarily softening the bone, making cutting and scraping easier. Once the bone is dry, it will return to its hard, resilient state.

c) Sawing, Drilling, and Grinding

Bone can be sawed into sections with a serrated bifacial stone knife or flake tool. After the saw cuts have been made to a sufficient depth, the bone can easily be broken by hand. Stone drills, either hand held or attached to shafts, may be used to bore holes through bone for making such tools as arrow-shaft wrenches. The small eyes of sewing and matting needles can be made by a sawing or twisting motion with a graver tip.

Polishing, final shaping, and sharpening were done with a sandstone abrader. Some tools were made almost totally by grinding.

Bone Tool Types

Since bone is not a universally well preserved material, we know little about the bone tool technologies of the cultures prior to the Late Prehistoric period. After AD 1000, bone tools are well known. The Mill Creek culture of northwest Iowa (ca. AD 1000_1250) exhibits a particularly rich assemblage of bone artifacts. Bone tools are often categorized according to their supposed functions.

a) Hoes

Late Prehistoric agricultural groups of the Midwest and Plains commonly made hoe blades from the scapulae of bison and elk. The long spine that runs the length of the bone may be easily broken off after a few deep saw cuts have been made. Portions of the bone may be broken away to give the blade a more symmetrical appearance. After the edge has been beveled and ground sharp, the hoe blade is ready for mounting in a split and notched wooden handle.

b) Knives

So-called squash knives also were made from the scapulae of large mammals. These tools were made by selecting a portion of the broken shoulder blade and grinding the thin interior bone edge sharp. Such tools would have served well in slicing soft plant materials.

c) Scoops

Scoops were made from the bison horn core and accompanying portion of the frontal bone. These tools were probably made by breaking off the desired piece of the skull and grinding the exposed edge sharp. Horn scoops were probably used as hand-held digging tools.

d) Fleshers

Saw-tooth-edged tools were commonly made from the long bones of large animals, particularly the metatarsals (long foot bones) of bison and elk. By breaking the distal end off at an angle and then sharpening and serrating the exposed edge, the tool could be used to strip the fatty tissues from the inner surfaces of fresh hides.

e) Hide Grainers

Tools for scraping and smoothing the inner surfaces of hides were made by breaking off the heads of a leg bone of a bison or other large mammal, exposing rough cancellous interior bone.

f) Sickles

Deer jaws were used in an unmodified state for threshing grasses. The front portion was frequently worked away and polished smooth.

g) Arrow-Shaft Wrenches

The ribs of bison and elk as well as the long bones of deer were sometimes drilled with holes for use in straightening arrow shafts. When arrow shafts were heated, these wrenches helped remove warps or irregularities.

h) Fishhooks

Fishhooks were made by two methods depending on the bone used. Toe bones of deer were cut and split lengthwise. The exterior surface of the bone was then removed by grinding, leaving only the hook-shaped ridge of bone inside. Larger fishhooks were made by grooving and grinding oval-shaped pieces of a split rib.

i) Awls

Awls are defined by a pointed tip made on any bone splinter. Awls, used as leather punches in sewing hides, were made from a variety of bones. The ulnae of deer could be cut, and then ground and polished to form a sharp tip. Splinters of rib and long bone were also ground into awls. Hollow bird bones also were sometimes broken and split to form awls.

j) Quill Flatteners

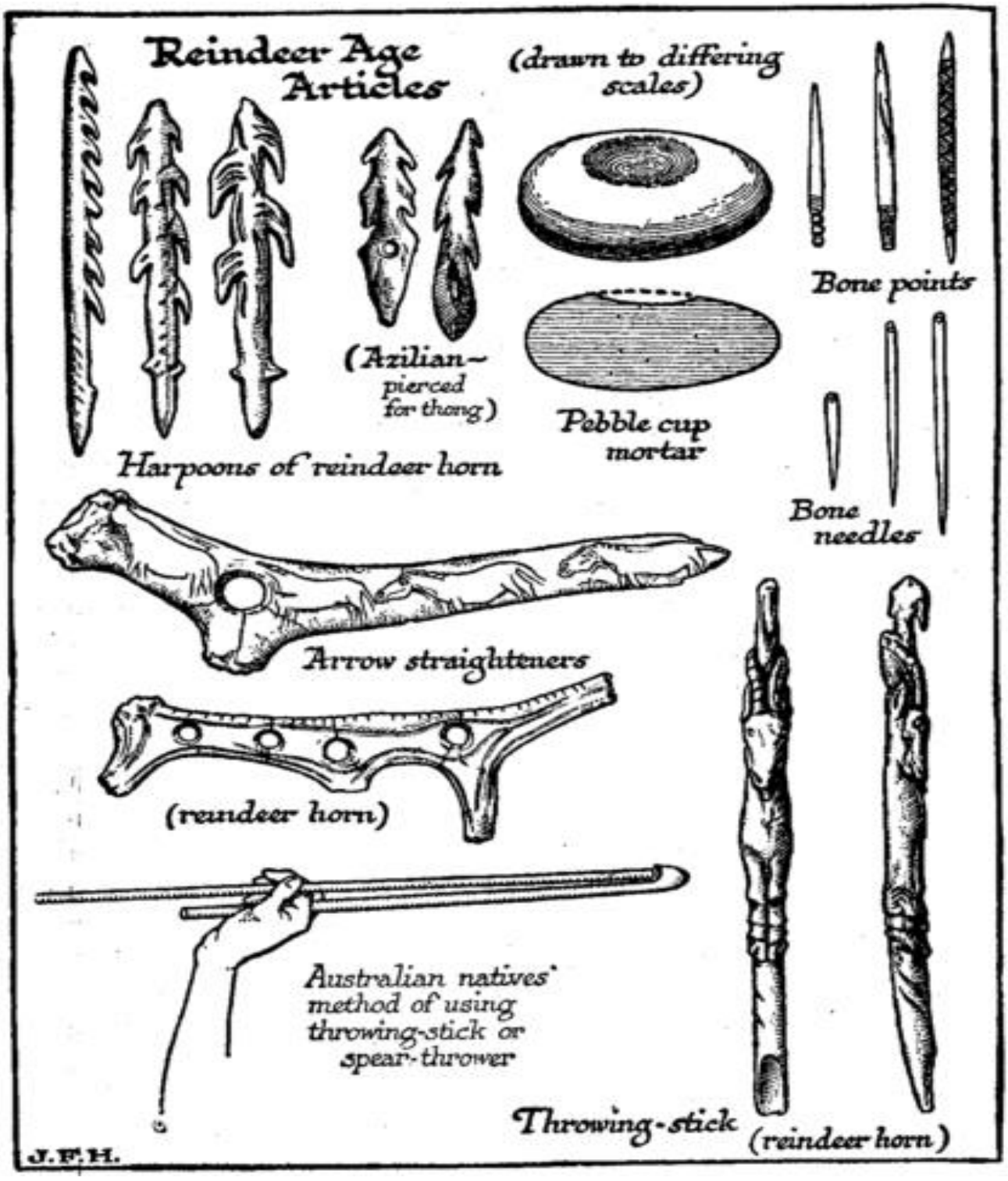
So-called quill flatteners are flat-ended tools made from long splinters of mammal bone. The rounded and flattened ends of these tools are thought to have been used in flattening porcupine quills for use as decoration. They may also have been used as pressure flakers in flintknapping or for smoothing in pottery making.

k) Antler Artifacts

Like bone, antler is tough and resilient. Unlike bone, however, antler is relatively solid and varies greatly in form among individual deer. Antlers are grown by male deer and are shed each winter. Antlers were perhaps most important to prehistoric groups for use as flint knapping tools. Soft hammer batons for controlled percussion flaking were made from the basal portions of antlers by cutting them to length and grinding off the rough burr at the base. Antler tips, cut to lengths of 3 to 10 inches, were used as pressure flakers. Antler tips were sometimes cut and drilled to make conical arrow points.

l) Harpoons

The bone was probably split with wedges, which left small barbs and breakings with hinge terminations on its side. The characteristics of the observed traces suggest that the wedges used were semi-circular in outline and about 8 mm large. The entire surface of the artefact was probably scraped intensively along its axis with a flint tool. The base of the implement was cleaned with utmost care. The scrapping was performed probably with use of a retouched toothed tool. On the head of the bone traces of sawing forming V-shaped cuts can also be observed. The surface of the harpoon head was ground only in its upper part. Both sides of the point barb were made in a slightly different way. It was sawn from two directions on the inside part of the bone, creating a V-shaped groove. Additionally, the shape of the barb was emphasised with a cut parallel to the axis. On the outside, the barbs were probably formed by whittling.


Reindeer Age Articles
(drawn to differing scales)
(Azilian~ pierced for thong)
Harpoons of reindeer horn
Pebble cup mortar
Bone points
Bone needles
Arrow straighteners
(reindeer horn)
Australian natives' method of using throwing-stick or spear-thrower
Throwing-stick
(reindeer horn)
J.F.H.

m) Spear Points

These artifacts are made with the compact osseous tissue of big mammal bones (probably marsh deer). Their thickness (2.5 mm) makes them too fragile to be projectile points according to the values presented by Guthrie (1983).

n) Hook of Spear throwers

They are represented by their hooks made from bone, antler or ivory. The hooks are made from deer astragalae and their manufacture requires a significant amount of time and energy.

o) Baton-de-commandement:

They have been found at Aurignacian and Magdalenian sites of the Upper Paleolithic in Europe. They have a joint at one end, often forming a T or Y shape, but always with a swelling of the antler at that end. There is a circular hole drilled through the antler just below the swelling or joint, and often a smaller second hole nearby on the shaft. Typical examples range from 6 to 8 inches (15 to 20 cm) in length.

The purpose of the tool was originally thought to be as a symbol of power or status.

p) Needles:

These were probably made by grinding a small fragment of bone in a groove in a piece of sandstone or some such hard surface.

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