

STONE AGE TOOLS

Stone tools are the earliest man made objects available to us. Though man must have used other material like bone, antler and sticks for offensive and defensive purpose, we do not have much trace of such objects, due to the disintegrating nature of the material. Since stone was the hardest material known to man (in the absence of metal), and available in abundance, he depended mainly on this material for manufacture of tools and weapons. For fabricating stones to the required size and shape, he employed different techniques.

EARLY STONE AGE

1. **ANVIL OR BLOCK-ON-BLOCK TECHNIQUE:** In this the pebble or block of stone which is to be broken for further use is itself hit against the projecting point of a large, fixed block of stone or anvil. Usually large flakes with prominent bulbs, which we find in the Narmada and early Sohan, Clactonian, were probably produced in this manner.

2. **DIRECT PERCUSSION OR STONE HAMMER TECHNIQUE:**

This was probably the most common and most widely used technique anytime and anywhere in the world. In this the pebble or nodule which is to be made into tool is kept in the right or left hand or knee, with suitable padding and sometimes against a tree trunk. Then with a pebble of suitable size and weight, the man gives a blow near the edge or the periphery of the larger pebble. A flake comes off with a well-marked bulb of percussion, from the under-surface of the stone. For alternate flaking the tool is turned every time a flake is removed.

3. **CYLINDER HAMMER OR WOOD OR BONE HAMMER TECHNIQUE:**

This technique is also known as Acheulian technique. Tools with unusually smooth and even surface were discovered from St. Acheul in France. Such a smooth surface could be obtained by using a hard wood, bone or weathered stone. As the hammer is comparatively soft, the force is applied on a larger area, as the edge of the hammer is rounded. Thus instead of the crack spreading from one point and giving rise to a marked bulb of percussion, it spreads from a larger area. This results in a flake which is very flat. A series of these flat flakes produce a nearly straight cutting edge. Whereas this technique was used mainly for finishing the tool, the older stone hammer technique was used for making rough tools. These types of finally finished tools bespeak of mental development, a sense of planning and design. As this technique was first noticed at St. Acheul, the technique is called Acheulian.

4. LEVALLOIS TECHNIQUES: A more advanced, artistic and skillful method of preparing flakes and cores seems to have been discovered a little later. As this technique was first noticed at Levallois Perret, a suburb of Paris, the technique came to be called Levalloisian.

Firstly, a core was carefully prepared by initial rough trimming of the sides and then the cortex was removed in such a manner that the flake scars usually meet in the center. In this way all irregularities, uneven surfaces were removed. Secondly a flatish place called 'striking platform' was prepared by removing very small flakes on the core at a point where the cortex and flake scars meet. Thirdly, a blow was given by a tool either directly or through an intermediary tool known as "punch" on this platform by holding the core with the left or right hand. The blow was given in such a way that it was almost at right angle to the platform or the access of the tool.

The result was that a comparatively thin flake, roughly triangular or oval in outline, came out. It had a clean under-surface, while the upper surface had shallow triangular, centrally directed flake scars. It required little or no subsequent retouch, because its edges were already sharp due to previous preparation.

Since the core after removal of flake looks oval, it is called a "tortoise core". Levallois technique appeared in the middle of the Acheulian stage. The Levalloisian technique is on the whole more economical though lengthy in process. Through, this technique only one flake could be obtained, and the core had to be prepared again, the size and the quality of the flake was assured.

3. DISCOIDAL CORE OR MOUSTERIAN TECHNIQUE:

This technique got its name from a French cave site of Le Moustire. For manufacture of tools using this technique they have used either i) A large flake with a flat surface on one side or ii) a flat nodule or core with one side flat. Next, blows were struck on the flat surface so that comparatively small flakes came out. By turning the core a large number of flakes can be produced. The resultant core shows a flat surface in the center and sloping rim all around. As the core resembles a disc, this technique is called Discoid core technique.

MIDDLE AND LATE STONE AGES

In the Middle Stone Age, all the above techniques were employed, apart from the introduction of new tools and techniques. The new tools are the blades, which are lengthy, and usually parallel sided. As these tools are slender (thin), and long fine-grained stone material like chert, chalcedony, agate, jasper, carnelian, etc. was used.

Primarily, two techniques i) Pressure technique and ii) Percussion technique were used in the blade production.

CORE PREPARATION: Whatever technique was employed for the blade production, the core had to be prepared first. The core was first trimmed to a cylindrical shape. Then small platforms were made along the edge of the core to prevent the punch from slipping. The cores were then partly embedded in hard earth or between two strips of wood, bound together by cords or raw hide.

PRESSURE TECHNIQUE: The worker would take a shaft of wood about two to three inches in thickness and three to four feet in length. This was provided on the lower end with a pointed bone, horn, tusk or antler. A crosspiece against which the chest of the worker rested was used to apply pressure through the shaft held vertically. While working the person would rest his chest against the cross bar and apply impulsive pressure. This results in a long slender flake, sometimes, ten to twelve inches in length.

BLADE BY PERCUSSION TECHNIQUE: In this method after the core is prepared, a short wooden punch is placed on the prepared platform and a tap is given, preferably, with a wooden piece. Due to the percussion applied a slender blade comes off. In already used cores, fresh blades are removed from the intersection of two earlier negative flake scars, so that the ridge formed by their intersection will form a more or less central keel on the flake. When wider blade is intended a blade flake with two parallel keels on its upper surface may be removed.

CRESTED RIDGE BLADES: To produce blades with wavy central ridge or keel first small flakes, usually in alternate flaking method were removed from both sides along a ridge. Then by using pressure or percussion technique a blade is removed. The ridge gives strength to the blade and also facilitates hafting in wooden or bone slits.

BLADES BY CROSS FLAKING : To produce blades with a sturdy backing, cross-flaking technique was used. To produce blades in this method, first blades are removed from the core in one direction and then the core is turned and blades are removed in to the blade and also provides better grip, when hafted in wooden or bone slits. diagonally opposite direction. This results in blades with a triangular cross section. Whereas, the cutting edge is sharp, the opposite edge is thick, which gives strength

NEOLITHIC TOOLS

The tools manufactured using techniques described above have coarse surface and uneven working edge, as they are manufactured using only flaking or chipping technique. But by Neolithic times a new technique called “grinding and polishing” technique has developed. This technique facilitated better control over the tool manufacture, which resulted in straight or even cutting edge. The process of manufacturing such tools is as follows.

First a pebble or a nodule of fine-grained rock is fashioned roughly in to the desired shape of the tool. This is done by block-on-block or direct percussion techniques.

Secondly, to remove the unevenness from the surface, small flakes are removed from the ridges with a pointed tool. This is known as 'pecking'.

Thirdly, the half-finished tool by pecking is ground on a rough rocky surface. For this large concave basin-shaped boulders or stones are chosen and with the help of sand or similar coarse material and little quantity of water serving as abrasive, the tool is moved up and down in the groove. After this process the surface of the tool, particularly the cutting edge gets a smooth even surface.

Fourthly, and finally the tools seems to have been given still smoother finish by polishing them against hide or tree barks. That is why we get Neolithic tools with highly shining surface without any grinding marks visible on them.