

The Making of an Arrowhead

Charles Harris

Illinois State Archaeological Society, Macomb, Illinois

The base of all attainments of stone-age man was the humble hammer-stone, and skill in its use made possible all achievements in the fabrication of tools and weapons preceding the age of metals.

Without question, the stick accidentally splintered to a sharp point or sharpened in rude fashion by fire, and the flint fractured to an equally accidental sharp edge were first used by man without any thought of purposeful manufacture; but when one stone was used to help shape another for special uses, a great step forward was taken. First, the clattering of a flint against another would provide sharp slivers fit for use as knives. This stage of development probably lasted for thousands of years. Then came a day when a pebble was used intentionally to strike flakes from a fragment to reduce it to a better shape or to give it a better cutting edge or to restore an edge of point dulled by usage. Definite in the use of the hammer came with practice and finally well-shaped and serviceable knives and javelin points were produced, as well as fine hand hatchets and a large variety of scrapers, borers, and piercing instruments. These advances in knowledge and skill had taken fifty thousand years and more to achieve. Then some tribe discovered a way of using a bone to serve as a punch to drive off flakes in such a way as to produce flint blades of greater fineness and greatly improved edge, as well as more graceful and convenient forms. All this occurred in Asia, Europe and Africa long before man appeared in the Americas. At some time, probably shortly after man appeared in America, the atlatl and the bow were used on both sides of the Pacific, and the making of the arrow head was begun.

Certain of the more ancient culture groups found in Illinois left few hints adapted for use as arrows, there being pretty strict limits in the matter of weight to which a practicable arrow point can go. As the matter of materials, while bone, horn, case and wood were used as arrow points, it is of those of stone with which I shall deal in this paper. Here we think always of flint as the raw material, but it is true that wherever flint or its brother, chert, with the kindred types of workable stone such as jasper, chalcedony, agate and agatized wood, were available, they were favorites for the purpose, except where plentiful supplies of obsidian could be had. There are large areas on the Atlantic sea board where these were not, easy to obtain, and quartz, slate, shale and other less desirable stones were used. In using these last, the hammer alone was used in most cases, the quartz in many localities being found in the form of flattened, rounded pebbles in ancient sea beaches and gravel bars. A series of blows with the hammer around the edges reduced the thickness and shaped the finished product, only a single blade being obtained from each pebble. Thicker pebbles were split and a blade obtained from each half, and in the case of some of the better working pieces a more refined form may have been obtained by the use of a bone flaker.

Most of the slate and shale specimens I have examined were too much weathered to show clearly the manufacturing process but as the cleavage was simple, the flakes removed large and few and the production most cases crude, the hammer again may have been the only tool used. It will not be necessary to say anything about the shaping of obsidian, as the cleavage and general process of manufacture were the same as in the case of flint. This brings us to the arrowheads found on the fields of the mid-Mississippi valley, but again we have a wide variety of working qualities, some of the material coming from glacial drift pebbles and boulders found along streams.

some from eroded surfaces, or mined from pits dug deep into the heavy clay residues of the limestone, some from chance exposures in limestone cliffs, and some from great veins of thick flint such as the flint ridge in Ohio. Some of this would be weathered, cross grained, checked, and as generally refractory as much of the quartz, grading up into compact smooth-grained flints which would yield ribbonlike flakes approaching the best obsidian in workable qualities.

Some campsites yield mostly crude blades made from some nearby supply of one of the poorer grades of chert, showing no work not possible with the hammer; while others show fine quality artifacts made from flint identical as having been brought at great expense and labor from high grade deposits hundreds of miles away; for instance, flint ridge blades from along the Illinois River, also nodular flints in large caches from Cumberland River sources.

In the more refined workmanship we find the blades carefully shaped with the hammerstone, then worked down by either pressure flaking or by use of the bone or horn punch. All this has been quite fully described in Bureau of American Ethnology, Bulletin No. 60. Although an old gentleman at Kankakee assured me some years since that in his youth he had seen thousands of arrowheads made by the Potlawatomies by heating the flint and applying a touch of moisture, I have not mentioned the method because all experiments by myself and others with whom I have compared notes have resulted in complete failure. At the time to which he referred, the Indians of Illinois had long had access to guns and steel knives and I could not but consider that he was trying to back up a theory by claiming eyewitness knowledge. On the other hand, I have seen specimens, some from local finds, but especially a fine curved knife from Egypt, that seemed almost unbelievable as works of the bone flaker; and Holmes cites a number of testimonies of early writers who speak of seeing this heating-moisture method used.

My neighbor, Mr. Charles A. Benson, in leisure moments has experimented extensively with the bone flaker, and has proved conclusively that at least the majority of the flint arrowheads and knives can be made readily by a method slightly different from any I have seen described, but easily within the mechanical methods known to the Indians. He has made use of some things not known to the red man, such as a vise and a light steel hammer, but the vise is used only as a means of holding a wooden clamp, which could have been done just as readily by a stick pressed against the clamp with the foot. Perhaps the Indians used such a clamp as that made from the palm of a moose horn found and shown to me by Mr. Walter R. Smith of Brewer, Maine, and which we were only able to explain as a device for holding flint while chipping.

Mr. Benson has found that by varying the angle at which the bone is applied to the flint, and the direction and force of the blow, he can strike off flakes either abruptly to produce a typical bevel or to draw the flake well across the face of the blade. By far the easiest point to make is the small point made from a thin flake, of the type used in large numbers by the Middle Mississippi culture, but the production of the flake from which to shape them requires a very skillful workman and a good grade of flint from which to produce them. The common Woodland type of arrow point, on the other hand, requires more flaking but can be made from a much ruder flake as a starter. Mr. Benson has never had access to a really satisfactory flint, mostly using the glacial deposit for his source of supply, and does not know whether he would be able to strike off long flakes from which to make the larger spears and knives if he had the quality needed, but specimens of his workmanship will, I think, clearly demonstrate that should necessity require, very satisfactory arrowheads could be produced by the percussion method which he used in his experiments.

In his work he uses the bone, well dried and free of grease, largely as a buffer to transmit percussion, having failed to get satisfactory results from pressure alone. The clamp is faced with a bit of leather to prevent too uneven local pressure breaking the piece being worked, and to provide a certain amount of cushioning to permit flakes to extend down within the

camp. Seating the bone firmly at the angle experience has proved desirable, a light tap with the hammer removes a flake, which practice has enabled him to control quite exactly. Usually the blow is applied to the side of the punch, rather than to the end. Reversing the work frequently, first to attain a working edge, then carefully trimming for symmetry, in a short time he will have produced an arrowhead in many cases better than any but the best made by the red man.

The experiments were purely a matter of obtaining knowledge, and Mr. Benson has never used his skill in producing any of the reworked "rare forms" nor ever parted with any arrowhead except as a gift to a friend.

* Holmes, W. H., Bureau Amer. Ethnology, Bull. 58.