Applying the Principle of the Cone to Functional Flake Scars

A careful study of the use scars on stone tools can sometimes determine the functional use and also the manner of holding. Past studies of such scars has placed emphasis on the direction of force, but has not included the angle of applied force which is, in turn, governed by the angle at which the artifact was held.

For the purpose of encouraging further and more detailed study of these scars, I would like to postulate a potential use of applying the technique of flintknapping to more clearly define these functional scars. It is conceivable, and I believe possible, that the principle of the cone as applied to flintknapping could be useful in diagnosing functional scars.

Two angles of force must be interpreted and these angles are indicated by the type and length of the use flake. Applying the principle of the angle of the cone to the negative flake scar could very well determine the angle at which the artifact was held. The use flakes may be related to cone angles and the direction of force aan then, in turn, be used to show the manner in which the tool was held. When a flake, or blade, is used as a knife for cutting flesh, hide or sinew, it is generally held at the proximal end and normally drawn toward the worker with the strokes being parallel to the long axis of the blade, or flake. In this case, the micro use flakes will be removed bifacially along the marginal edges or edge being used. When the tool is drawn toward the worker, functional scars will be short and steep in a direction away from the user - or toward the distal end of the blade. This is due to the slight movement of the blade from side to side, causing side pressure on its very thin margin; or by the blade contacting bone or some hard resistant surface.

When the flake, or blade, is used with care it only becomes dulled by abrasion and will have no visible use flake scars. This abrasion isprobably due to the material being cut having been contaminated by mud, dust or dirt.

Since function does not always produce use flake scars on a tool, a quick field test to determine if the flake has been used is to carefully run the finger along the edge to determine the sharpness.

The use of the binocular microscope is often necessary to determine wear patterns, or polish from use, which is adequately covered in S.A. Semenov's Prehistoric Technology.

An example is the common scraper used for removing fat, flesh and tissue from skins - the scraper held vertically and being drawn toward the worker. This type of use will cause any use flakes to be removed at the scraping edge from the ventral to the dorsal side. However, use flakes would only be present if the scraper edge contacted some resistant material hard enough to errode or scar the stone. If the scraper did not make such contact, then the edge would just receive a polish.

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On the other hand, the aboriginals of Australia used replica implements of this scraper type for forming wood and they hafted and used the tool in much the same manner as one would use an adz. These artifacts were secured to a shaft of hard wood by the use of spinifex and then used for wood working in much the same manner as a hand-held wood chisel. The use side of the artifact was the ventral or flat side of the flake that had been previously modified by unificial flaking on the cutting edge. Tools used in this manner will show pronounced scars but the pattern will be an entirely different one than those found on an ordinary scraper.

Suggestion of the further study of flake scars is projected merely to point out the need of further and more detailed experiments pertaining to actual uses of various cutting implements on diversified materials purportedly used during the Stone Age. Limited experiments have been made by the writer using obsidian blades to cut and scrape many types of materials and incorporating various holding methods. The more vitreous materials, such as obsidian, leave sharply defined use scars. In the future, I hope to make several thousand blades to insure adequate testing of the manner in which they were used and held to further examine the use flake patterns for consistency of methods.