Wans Copy

Ce 1117

Type final copy
Send cc to Wan
along w/ this one.

THE FLINTKNAPPERS RAW MATERIALS

by

Don E. Crabtree

THE STONEKNAPPERS RAW MATERIALS

by Don E Crabtree

A basic step in determining and interpreting working techniques of artifact manufacture is an understanding of the proper stone for toolmaking and reconciling the relationship of techniques to material. This is essential because the type of material used has a direct bearing on methods of manufacture; poor material restricting and fine material allowing the toolmaker to control the thickness, width, length and uniformity of the flakes. When one is able to control the four dimensions - thickness, width, length and curve - when removing a flake, he can then produce almost any tool he may need. Further, a working knowledge of the stone is essential to the knapper, as any variation in its quality requires a different method of flaking.

This text will attempt to describe and explain which materials are used in the toolmaking industry, to resolve what type of stone is adaptable for flaking and to clarify some of the working problems related to material which confront a flintknapper. My analysis of lithic materials is based on thirty years of experiments in stone working and may differ from the mineralogist's definition because our purpose is not the same.

What are lithic materials? Ideal lithic materials are kinds of stone with the necessary properties of texture, elasticity, and flexibility. They must be of an even texture and relatively free of flaws, cracks, inclusions, cleavage planes and grains, in order to withstand the proper amount of shock and force necessary to detach a flake of a predetermined dimension. When the required amount of force is applied to a properly prepared platform, a cone is formed, and therefore, portions of the stone

can be removed producing flakes with a very sharp cutting edge. There is a relationship to isotropism and conchoidal fracture, but the final results depend on the surface and the conformation of the material. The termination and shape of the flakes are controlled by the desires and ability of the person applying the force and, therefore, do not always resemble the shell-like or conchoidal fracture.

Synonomous names are sometimes used to describe the same material. For instance, slate is sometimes described as metamorphosed clay, metamorphosed sandstone called quartzite, silicified sandstone called quartzite, hornstone called flint, flint called chert, chert called flint, green jasper called bloodstone, etc. When speaking with other flintknappers, i.e. Dr. Francois Bordes, Dr. Jacques Tixier and Mr. Gene Titmus and we want to encompass the entire field of adaptable working minerals, we generally use the words "lithic materials", "flint-like materials", or simply "silex". The word silex has the advantage of unifying a single group of isotropic materials but the disadvantage of not indicating, by name, the differences of character, texture, color, etc. Therefore, we sometimes qualify these terms by describing sources such as "French flint", "Flintridge, Ohio flint", "Danish flint", "Oregon obsidian", "Idaho Ignimbrite", etc. This gives immediate identification of material and conjurs up a quick mental picture of the minerals and the problems or bonus qualities contained therein.

The stoneworkers first concern in choosing working material is quality of texture and this is governed by the fineness or coarseness of the micro-crystalline structure of the material. Generally, the coarser the stone texture, the tougher and more

difficult it is to remove regular and uniform flakes. But, conversely, the platform prepared on coarse material will collapse more readily than that fabricated on finer textured material. Certain materials will allow the platform to collapse, leaving a dull edge. Others haven't sufficient strength or flexibility to permit detaching a long thin flake and will break off short causing multiple hinge and step fractures. Personally, I cannot do the well controlled pressure flaking on coarse-grained materials that I can achieve on finer, more closely-grained stone. The few collections I have had an opportunity to study have revealed this same relationship of well controlled flaking to fine-textured materials. Therefore, I reiterate that we must consider material in our analysis of tools, our explanation of type, and the study of technology.

Each source of stone has certain attributes of which the worker is aware. For example; when Dr. Francois Bordes and the writer were doing some experimental work at the University of California at Berkeley, materials for our project were from many and diverse locations, i.e., Southern France, Northern France, Indiana, California (2 locations), Oregon and Idaho, representing seven widely separated sources. After a week of working, the materials were almost entirely utilized and the resulting array of flakes were comingled in one big heap. Yet, if any single flake had been given us - and this happened - we could identify its origin without error. This serves to emphasize the fact that after the toolmaker has worked with a given material he will be able to identify its peculiar properties.

A toolmaker's method of identifying good lithic materials is: texture, luster, surface character, cortex (rind), color,

transparency, sound, flexibility, sharpness of removed flakes and perhaps most important, the amount of resistance to the necessary force required for detaching a flake. The degree of luster is used as a guide by the toolmaker to determine if the stone will permit him to regulate the amount of force necessary to remove a flake of a given dimension, and is one of the most useful attributes for determining workability. Variations of luster include glassy, waxy, greasy, satiny to dull, matt, flat, sugary, fine crystalline, medium crystalline, coarse crystalline and sandy.

Most types of suitable lithic materials have identifiable qualities recognized by the stone-worker. When choosing material, he will determine the homogeneity of the mass, appraise the texture and luster, and choose the raw material of appropriate size to produce the size and type of finished tool he desires. A myriad of bright colors is desirable, but color, in most instances, does not indicate workability of stone. When making an appraisal of the workability of flint-like materials, one may first tap the stone (lightly to prevent bruising) and listen to the sound of the tapping. If the stone gives off a dull sound, one can expect undetectable cracks, fissures and planes of weakness. However, if the stone has a sharp ring, the chances are good that the material will be of working quality. One may then remove a test flake, or cleave the stone to examine it further. If this shows the material to be free of crystal pockets, foreign deposits and shows the right luster, then the worker assumes the stone will lend itself well to the manufacture of an artifact. The final outcome, of course, will depend on the skill of the worker.

If the material is secured from pebble and cobble alluvial deposits, they may have lost a great deal of their identity due to pounding and rolling in the water. However, this rolling and pounding gives a clue to the workability of the stone. The projections and irregular edges receive the greatest portion of the impacts and each time the stone bumps against another cobble, a distinctive bruise is produced. Each of these bruises is actually a cone. The multitude of cones are superimposed at random and intersect one another, reminiscent of the surface of the moon or to what we call "goose bumps". This type of surface enables one to identify which cobble has the desirable working properties. Cobbles lacking this type of surface can be assumed to be granular and unfit for the manufacture of stone artifacts.

Often reference is made to a large thick biface, irregularly surface-flaked on unsuitable material as "crude heavy biface", "crude percussion work", or"crude pressure work" whereas, in reality, the worker was a skilled craftsman to have produced any type of tool considering the poor quality of the stone. A stoneworker will always relate the quality of the workmanship to the material. Poor material showing skilled and controlled surface techniques definitely indicates good workmanship. Good quality material skillfully worked also denotes good workmanship. But we cannot reverse this procedure and assume that any artifact showing controlled work denotes good material. We must keep in mind the human factor of finding good work on both good and poor stone and poor work on both good and poor material. Also a factor in analysis is that some do not recognize thermally treated stone and may be viewing altered stone and calling it good material whereas it could actually be inferior stone improved by heat treatment. But when we see poor work on quality stone, I

think it is safe to assume that we are viewing unskilled work unless we find that the worker was merely preforming good material which was later to receive the refined techniques. We can relate techniques to material but we cannot relate material to techniques, and must be careful to judge character of material before we appraise the quality of the work.