<u>PRESSURE BLADES AND CORES</u>

by Don E. Crabtree

In recent years there has been an accelerated interest in the technology of core and blade manufacture and in particular those made by pressure. Recently there has been invaluable research achieved in Mesoamerican blademaking technology in an effort to document the diverse techniques used in the manufacturing process. Pressure cores and blades have been noted in many places in the world but probably were developed independently and not related geographically. Some occurrences of pressure cores and blades on this continent are the Arctic blades and cores from the Berring Straits to Greenland; the Hopewell blades and cores of the upper Mississippi Valley; the distinctive blades from the Channel Islands off the coast of California; and, of course, the abundance of pressure cores and blades of Mesoamerica - ranging geographically from the Island of Cozumel to the Pacific Coast. I do not know the north and south boundaries of this core and blade industry but generally they occur from Central America to northern Mexico. Other pressure cores and blades which deserve mention are those from Japan known as the Sheritaki blades and cores. North of Japan on the Lena River in Siberia there was a very sophisticated blade and core industry having all the characteristics of those produced by pressure. India also has distinctive pressure blades and cores. After much experiment and research, Jacques Tixier verified the Capsian blades and cores as the result of a pressure technique, and I might add they were made by a technologically superior pressure technique. Afghanistan cores and blades are made by pressure and are distinctive because of the skill involved to achieve the precision of blade detachment and core formation.

There is, no doubt, a spacial distribution of many other pressure cores and blades but those already mentioned are varied and distinctive. Time does not permit a detailed description of all of the known pressure blades so, for now, we will concern ourselves principally with the pressure blades of Mesoamerica.

The pressure cores and blades of Mesoamerica incorporate a variety of techniques, form and size. Some time ago I published a paper on Mesoamerican blades and cores but, at that time, I was limited to a study of cores and blade fragments which I personally collected from vendors and shops in Mexico. Naturally, these were out of context and could only be associated with the area in which they were purchased. Since that time it has been my good fortune to be able to examine a number of cores and a limited number of blades from other localities south of the border. I wish to thank Tom Hester and Robert Heizer for the opportunity to review the Guatamala specimens; Junius Bird for a gift of five cores from Oaxaca, Mexico; Jose Luis Lorenzo for permitting me to examine the cores from the Metro excavations in Mexico city; Irwin Rovner for an inspection of the Carnegie collection from the Yucatan; Lynn Langdon for a loan of cores and blades from the west coast of Mexico; and Maria Gomez for a review of cores from Colima, Mexico. After reviewing and analyzing the cores and blades from these limited areas I feel the need for a reappraisal and re-evaluation of the stoneworking techniques represented by these collections.

When further excavations are made in Mexico, Guatamala and Mesoamerica I feel certain the sites will divulge abundant pertinent data to verify the diverse manufacturing processes and their related diagnostic traits. At this time, it would appear that the pressure core and blade industries offer a greater potential for reconciling the life styles, trade routes and technological developments in time and space than we can expect from flaked artifacts.

We are aware of considerable differences in the size of the cores and the length and width of the blades. Rovner has found cores on the

Yucatan only 2 cm in length while I have observed in Colima and which Hester and Heizer have found in Guatamala cores approaching 25 cm in length with blade widths proportional to the cores.

All cores from Mexico are not polyhedral. Some retain the original cortex on approximately one third of the surface. At Teotehuacan one will observe different degrees of skill represented by the cores. Some are exquisite - the result of superior control and skill while others appear to be the efforts of a less skilled workman or the product of learners. The malformed cores I examined from the valley of Mexico were out of context so it could also be the result of a time differential. The form of these cores is also highly variable. The most common are submarine-shaped; others have parallel sides; some are wedge-shaped or sub-conical; some are oviate and elongated in transverse section; and still others are flat on the sides yet flaked on all surfaces of the perimeter. The tops or proximal ends of the cores have many diagnostic attributes. Some are exhausted cores with no further space at the top for platform preparation - thereby having a pointed proximal end and no chance of rejuvenation. Others have been ground on the proximal end to prevent the pressure tool from slipping during the application of the outward force. There are others which have a plane surface platform, the result of the original flake scar. These are unmodified by additional flakes which poses the problem - How did the worker prevent the pressure tool from slipping on the plane surface? I have also noted cores which have platforms prepared by the removal of small individual flakes around the perimeter and, in this instance, the worker used the pressure bulbs to prevent the slipping of the pressure tool. Also, often the natural eroded surface is used by the worker as a platform surface to avoid slippage. Some appear to have the platform surface etched - but I have not determined the means of this etching. There is also evidence of the employment of a scribing device made of some hard material and used to score the margins of the core top in a manner similar to the repeated use of the tip of a glass cutter. There are many other means of platform preparation - but these are just a few I have noted. Some of the core top grinding was extensive - removing the bulbar parts of previous blade scars. This may be the result of removing crushed platforms on the margins which were the result of miscalculation by the blademaker. If the top of the core was not removed or rejuvenated by detaching a tablet then grinding could be employed to allow for the removal of additional blades - a form of rejuvenation. The removal of a tablet is, indeed, a complicated technique and not fully resolved. Aboriginally, the worker was a master at this technique. But, experimentally, when the core top is removed, the opposite side of the core is generally detached with the rejuvenation flake. Many experiments have been tried to resolve this technique even to the extent of using heat differential but all of my tests lack the skill and accuracy of the prehistoric blademakers. Continued experiment may resolve some simple approach to this technique of removing the core top. The Capsian flint cores of North Africa show evidence of repeated removal of core tablets after each series of blades were detached from the perimeter. How did they do it? As yet, I don't know but both Tixier and I are experimenting to resolve this process.

Some of the problems of core and blademaking are still unresolved e.g. obtaining the necessary amount of control to shape the cores with parallel sides and yet not remove the tip of the core; and the detachment of pressure blades without removing the overhang left by the detachment of prior blades - just to cite a few. We still do not know what pressure tools were used aboriginally to form cores and detach blades and we have not defined the composition of the pressure tool tip. Experiments have involved using a wodden shaft with an affixed tip of hardwood, bone, antler, horn, metals, copper and bronze. Copper and bronze tips were the most satisfactory. Experiments reveal that pressure tools other than the chest crutch are more satisfactory when making small cores 8 cm or less. Unfortunately, the Spanish historians failed to describe in detail the pressure flaking tools and the holding devices.

Hopefully, when Tom Hester and Robert Heizer excavate the Papalhuapa site, many unresolved problems of pressure blademaking will be interpreted. Our experiments are an attempt to duplicate the stone tools of prehistoric man. In many cases we achieve replication or a parallel yet it is evident from an examination of aboriginal cores and blades that more than one combination of techniques was used during manufacture and particularly during the preparation of the core prior to blade removal.

It is unfortunate that so few intact blades exist in relation to the amount of cores. The lack of sufficient blades makes the problem of evaluation and analysis difficult because the dorsal side of the proximal end of the blades often bear diagnostic traits which would be useful to interpreting the technique of pressure core and blademaking.

The explanation of making pressure cores and blades is so vast and so complex that I could go on for hours. These are just a few points which may furnish food for thought for those working in lithic technology. I could go into further detail and explanation but this would take so much time that I am afraid I would be talking to an audience of nappers and I don't mean knappers, spelled with a K. So suffice it to say that there are many and varied techniques of pressure blademaking; multiple stages, and many unresolved problems which should be a great challenge to the future students of lithic technology.

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