THE CUPSTONE A SOLUTION TO THE LONG-STANDING MYSTERY by Scot Stoneking

It was the Spring of 1989 and the second day of hunting arrowheads in the Tuscarawas River Valley just to the west of Newcomerstown, Ohio. On a previous trip, I had mentioned to my friend Ed that I had seen an unusually large piece of sandstone with several "cups" in it and today we were on a mission to go back and recover it. It was bigger than I had remembered and extremely awkward to carry but I was so proud, grinning and sweating and sinking a bit further into the ground on the return trip across the field.

I thought it was interesting, to say the least. What was it's purpose? What was it's meaning? I needed to find out more about what the experts had to say about this curious object. I needed to consult my copy of *Ohio Stone Tools* and see if there was some insight that I may have missed.

Upon getting back to the truck, Ed and I discussed some of the speculation surrounding this common artifact and both of us agreed that they were weak theories at best. The conclusions that others had drawn concerning these artifacts seemed to me to raise more questions about it's real purpose. The most common names associated with the artifact are "Nutting Stone" and equally confusing, although in my opinion more accurate, simply a "Cup Stone."

Were there no logical explanations as to

how they were used or even how they were made? Why would a man take the time to fashion a stone to hold a nut so he could crack it, when all he had to do was wrap it in a single layer of leather and whack it with a rock? Why would he crack a nut anywhere near sandstone? Wouldn't he have to dig the meat of the nut out of the bottom of the crumbling stone cup? Why were there multiple cups on opposite and random facets of the artifact? Or was it assumed he simply turned it over to dump it out, along with shell, debris, sand and dirt?

If the cups were to hold something else, then what? Perhaps paint? I let my imagination fly! What was this thing used for?

True cupstones are different from the wide variety of common pitted stones, and should not be confused with those artifacts. Most will be made from course-grained sandstone, and have a single or multiple cups; often located randomly on several facets of the stone.

The answer came to me one afternoon shortly after retrieving that huge artifact.

I was sitting on my porch practicing my fledgling flint knapping skills. I wanted to learn the very first art form because I have been a professional artist for most of my adult life.

My kit was a simple collection of ba-

sic traditional tools recommended in Waldorf's book, *The Art of Flint Knapping*. It consisted of a small hammer-stone, a deer antler base from a young Whitetail buck I had taken a few years earlier that I had rounded at the end, the tines that I had cut from the same rack to use as pressure-flakers and notch makers, a flat piece of sandstone to use as an abrading stone, and a few pieces of heavy leather to protect my thigh and hands as I worked the flint into eversmaller useless blanks.

My percussion billet wasn't very big but it did the job at my novice level as a flint knapper. I kept it smooth and rounded by stopping occasionally to dress (smoothing) the surface with a file so I could drive a better flake.

Deer antler, or other antlers such as Elk or Moose are the perfect natural tools to work flint into shapes. The reason it works so well is that it is hard enough, yet soft enough to "stick" for a micro-second on the edge of the flint and build a shockwave in the stone at a specific angle that travels through the stone and "pops" a flake off the opposite side.

That may sound crazy, but that's how lithic reduction is done and how flint tools are made. I won't spend a lot of time on the craft of flint knapping, although it's important to remember that the antler needs to be rounded for good aim and smooth for



True Cupstones Left and right - Jim Bennett Collection Center - Stoneking, ex-Gilbert Dilley





a good "stick" when it impacts the edge of the stone.

Multiple hits add many nicks in the antler and thus softens its surface. As I mentioned, the antler is already the right hardness, so a chipped surface, being softer, doesn't work as well.

After dressing my antler billet, I picked up the flint I was working with and reached for my abrading stone. It actually makes the surface of the flint at my intended target platform a little rough so the antler has a better opportunity to stick and drive a good flake across the centerline of my blank. Well, here I go again, talking in flint knapping terms. I suggest you talk to a flint knapping guru or read up on the art. It is truly fascinating. And be sure to give it a try once you've read through the basics. You'll be amazed at your own success with it.

When I drag the sandstone abrader across the flint edge, it eventually makes a groove in the sandstone. Abrading stones are another common artifact usually associated with or in context with flint knapping workshop sites, along with hammer stones and "Cup Stones."

As with all lithic reduction and stone forming, the technique is to chip or wear away one stone by striking, pecking or grinding it with another. If you hold two stones of equal size, weight and composition, one in each hand, and strike one against the other, the stationary stone will loose more material at the point of impact than the one doing the striking. It is simple physics and I call it "The Headbutt Effect."

I was sitting on my front porch amid a pile of flint flakes, staring at the groves left in my abrading stone, and I thought, where is the evidence in the archaeological record of any tool that may have been used to dress an antler billet in a manner that would not leave flat spots, but rather, a smoothed and rounded surface?

Suddenly I had an epiphany. What if a dense material like antler, for example, is ground into a piece of sandstone like the abrading stone? Since I am not talking about an impact but rather a vigorous twisting action, the results would be a smoothing and rounding of the antler end as well as a depression beginning to grow in the grainy sandstone surface at the same time.

"These cupstones could be the result of a simple flint knapping tool dressing process." It all made perfect sense and I couldn't wait to test it. So I grabbed a nice thick piece of fresh sandstone and my antler billet and started twisting it back and forth with a little wrist-action and in less than a minute I had made a near-perfect cup in that stone! And, my billet was dressed and rounded smooth. I was really on to something.

I am convinced that this theory is the most likely out of all the theories I have seen. While it is not essential to knap flint with an antler billet (wood, bone and stone can also be used), antler yields the best results when using traditional tools.

I recently acquired a collection of Kentucky artifacts with a few Ohio relics mixed in. There was a fine example of a roughly rectangular cupstone with more than 25 cups evenly distributed and tightly spaced across the top and bottom surfaces.

Most of the cups were close to the same diameter and depth. I had often wondered if there might be any significance to the size and depth of the cups on any particular cupstone and the artifact in this collection got me thinking about it again.

If a flintknapper used the sandstone to dress his antler billet, then why would he need to start new cups and move on to another location on the stone once it reached a certain depth? The answer may be simply material conservation and efficiency.

Imagine for a moment, that you live in a time and place where Whitetail Deer are

crucial to your survival along with having to continually manufacture the tools that are essential to take down large game animals and help process them for food and other raw materials. Resources were not always easy to come by.

Archaic man would regularly be on the move in search of game, stone, shelter and water. Scouts and hunting parties would carry only what was necessary on longer and longer expeditions from their camp. The cupstones were made wherever flint was being worked or reworked. That would explain their concentration in long term habitation sites and seemingly random locations throughout the world, spanning the early Archaic to the Late Woodland periods. I suspect artifacts with multiple cups were more likely found at established campsites or workshops and the common single-cup stones would be found in random locations.

The archaeological record shows evidence that early man conserved his resources and it is especially evident on flint tools. They often kept the edges sharp by only working one side of the edge, thus conserving material and getting the most use out of a tool as possible. Working both sides of an edge chips away twice as much flint. This conservation of material may be why the depressions on a cupstone are somewhat uniform. When an antler billet is dressed by rotating it against sandstone, the cup created by that action would reflect the



Even a weathered hard piece of sandstone is easily transformed into a cupstone when an antler billet is smoothed and dressed by rotating it against the surface. Freshly broken stones are much softer and yield faster, more efficient results.

diameter of the tool. Perhaps the continuous use in one location caused a build-up of debris or the cup became too smooth to be effective and a new location on the stone face was chosen.

My experimentation did not show significant antler debris building up in the cup that would cause it to be less effective in smoothing the billet but the end of the billet grinding against the sandstone caused the stone to fragment and lose granules which accumulated as the cup was formed. The effect on the billet was lessened if the debris was not cleared from the cup, allowing the fixed grain to wear against the antler material. (The loose sand in the cup would however, produce a finer abrasive that would help the antler become very smooth with additional effort.)

Imagine an Indian knapping flint. At his right side is a large chunk of sandstone he is using to dress his antler billet. At the moment he realizes that the tool needs dressed, he reaches over, gives it a few quick twists against the stone and goes right back to the flint.

He would have no need to pick the large stone up and empty the debris from the cup if he had room on the dressing stone to start another. Once the available space was used up, he might turn it over and use another location or simply blow the debris from the cups and use them again. It may have been a simple matter of efficiency. The arrangement of the cups on these artifacts is also evidence of this procedure. It should be noted that the sandstone used in my experiments varied from freshly broken material to weathered stones. The latter being much harder to effectively produce a cup if the location was not first started with a pecking technique. However, the results were the same. The only difference was efficiency.

Found in Coshocton County, Ohio by Dwight Schlimm



The similarity in the size of the cups on a vast majority of these artifacts is also a good indication of the average size of the antler bases that were most often used; that being from a younger deer not more than 1 -3 years old.

While larger and heavier antler bases would be more desirable to flint knappers, it is apparent that larger mature bucks may not have been readily available to donate their tools because of the heavy pressure put upon the deer population from the indigenous people. Antlers from younger deer are more dense at the base, whereas larger antlers have a softer marrow-like core closer to the base that is surrounded by harder material.

I have seen many examples of cupstones that have depressions that are generally more conical in shape. These are almost as common as the half-sphere cup-like depressions.

No one can be absolutely sure but it seems to me that the conical depressions can be attributed to a similar dressing technique that may have been used on the pointed tips of an antler for pressure flaking and notch making.

Alternatively, there are sufficient examples of conical depressions that suggest they were formed by hardstone pecking rather than rotational wear. Perhaps they were formed in that manner to create a dressing tool that would make a more conical shape on the end of a billet. The advantage would be to have a finer aiming point for percussion flaking without sacrificing the advantages of a heavier billet.

The most likely scenario, however, is that the pecking technique was used to create a starting position for the rotational dressing procedure. It makes sense that a knapper would increase the efficiency of the process by first pecking various locations on the sandstone surface which is easier than starting a new location with the rounded billet. The pecking can be done quickly and easily with an antler tip. I was able to peck out a dozen or so conical locations in a piece of sandstone without much more than 1/8 inch wear off the antler tip.

Modern flint knappers rarely use antler billets throughout the knapping process because copper tools are more readily available, last longer, and are often more efficient.

There are still a lot of knappers that use traditional methods and tools and I believe

it is important to share those methods in educational demonstrations.

The lithic arts are truly the first beautiful and useful artistry created by human hands. If you really want to know how it was done for thousands of years, you've got to use the right tools. And ancient man recognized the importance of efficiency.

The stone of choice since the very beginning was flint. To work it into something useful you will need the right tool for the job. It is amazing how nature provided the perfect consistency in deer antler to help man survive and thrive; and how one previously insignificant artifact was used to smooth the billet for better results in the manufacture of flint tools across the globe.

There are many interesting facts about cupstones that make me wonder why they are often overlooked. I believe they deserve more credibility in the big picture of early human development than previously realized. They tell a story that should give them higher recognition in archaeological context and we need to stop and think more about history than we do about the value of these relics.

After all these years, and countless discussions about these simple and misunderstood artifacts, I still have plenty of opportunities to share my observations with folks who are curious about the things they find. I stress the importance of common-sense observation and fact-based imagination when you hold a relic from ancient history in your hands. We should always consider the context, but remember that nothing is insignificant in the search for the truth. It is important to encourage free thinking and sometimes we just have to read between the lines.

I would encourage everyone to spend some time looking at archaeological collections wherever they are exhibited. The rich heritage of Ohio's prehistoric past is truly world class. But let's not forget the common, less-valuable artifacts that tell important stories of everyday life and survival in prehistoric times.

Scot Stoneking Lithic Restorations Massillon, Ohio

A comprehensive study on Cupstones and the tool dressing theory will soon be available through my website at www.scotstoneking.com