CHAPTER X

THE USE OF BONE, SHELL AND HORN

In the discussion of prehistoric artifacts, any classification must necessarily be more or less artificial. Of the three methods of classification commonly used, i. e. classifying by cultures, by use and by material, we have adopted the latter as best suited to the description of the artifacts which we have found in Kentucky sites.

The first of the articles to be here discussed, therefore, are those made of bone, shell and horn since these can be grouped together conveniently and rather naturally and since they represent an extremely primitive type of handicraft.

It is to be expected that aboriginal man would find a variety of uses for bone, shell and horn, because such materials were plentiful in his day, and ready at hand. Prehistoric man was largely a meat-eater and as a hunter and fisherman his mode of life made it necessary that while taking his food from the bountiful hand of Nature, he must at the same time bring to his cave, cliff dwelling or village site large supplies of such material. Bone, shell and horn were therefore by-products of his daily struggle for existence, and accumulated in and about his dwelling in vast quantities. The magnitude of such accumulations in many prehistoric dwelling sites in Kentucky bears convincing testimony to the large numbers of individuals living on some of these sites, and again in limited areas conclusively shows that in the case of certain caves and rock shelters the length of time they were inhabited is to be reckoned perhaps in centuries and scores of centuries rather than in years and decades.

As an example of this, we have mentioned in a previous chapter the mounds along the Green River in Ohio and adjoining counties in which shell and bone accumulated in such vast quantities that mounds were formed which are even today eight to ten feet high, and cover areas varying from three to ten acres. The owner of one river farm stated that the mound on which his house, barns, and other outbuildings rested, had an area of some seventeen acres.

In the case of cliff and cave dwellers, investigation shows that in many cases the large accumulation of bone and horn in and about the cave often became an embarrassment to further occupation necessitating even in that remote day a "house cleaning." This was not caused by "a decent regard for public opinion" or because of a desire to follow the laws of sanitation, but from sheer inability of the cave entrance to contain any more camp debris. This house-cleaning was usually effected in the case of the cliff-dwellers by the simple expedient of pushing the accumulated bone and other residue over the edge of the cliff where it accumulated at the bottom in great piles. Being in the open, subject to the action of weather it of course gradually decomposed at the bottom as new material was added to the top of this talus. At least in one place under a cliff dwelling near Vine Grove in Hardin County, Mr. Hugh Yates thought it profitable to transport by wheelbarrow, the very rich accumulation of disintegrated bone and ash from under the cliff ledge to his tobacco field nearby, and greatly increased the fertility of a hillside patch of some five acres by spreading on it this accumulation of centuries.

Not only did primitive man have an abundant supply of bone, shell and horn, but the manner of his life gave him abundant opportunity to see the possibilities of such substances as raw material ready for manufacture into useful articles. He must early in his self education have learned by actual experience that any large bone when broken by a torque always "splinters," *i. e.* breaks longitudinally forming a number of long sharp pointed fragments. Such bone splinters would be, in the hand of primitive man, no mean weapon of offence or defense. Doubtless it was by actual use of such splinters that he first learned that the portion he had in his hand became smooth by use, and that the point could be improved by rubbing or scraping off the sharp corners. The knowledge gained that "bone could be worked," it was a comparatively easy step to develop the manufacture of bone knives, spear and arrow points, awls, and, perhaps later, ornaments. It is well known that such implements of bone and horn were made and used long before man knew how to grind stone or chip flint. In fact, it seems that the working of flint in the hands of primitive man

necessitated first the manufacture of some of the bone tools which are to be described later.

Again it is not to be wondered at, that primitive man should have learned to work shell and to manufacture shell objects of veneration, and to use shell material for personal adornment. Who has not, as a child, been attracted by the iridescent color of some fresh-water or marine shell found on the bank of stream or on the ocean beach, and been tempted, at perhaps some inconvenience to obtain the shell and carry it home? Ancient man, of necessity a close observer of nature, was not a stranger to this desire to possess the beautiful. Being limited in the number of materials which would allow him to express his desire it was very natural that he should turn to the use of shell because here was an inexhaustible supply of material so beautiful that in our day "shell pink" and "pearl gray" and such terms, have been accepted in our vocabulary as poetic expressions of fact.

We cannot doubt that early man made very beautiful ornaments of bone and shell. The beads, gorgets, hairpins, ear and nose ornaments and pendants after remaining hundred of years in ash heaps, graves, kitchen middens, in caves or in mounds, sometimes near the frost line, and often subject to slow decay, still show beauty of form and color, and often what must have been very beautiful carving. After such exposure to decay, to the chemical actions of soils, which often causes such artifacts to become encrusted with iron oxide, and to the chance for mechanical damage, such shell specimens must now be regarded as but the ghost of their former selves. Having in mind the beauty that some shell gorgets still retain, we get some idea of what must have been their pristine glory, when first made, showing the natural colors of the shell, with high polish, and engraved design, unmarred by time, decomposition or accident.

Artifacts may, in general, be classified, aside from their materials, as to their use, *i. e.* as to whether they were used for utility or ornamentation. For this purpose we may classify bone, horn and shell and objects made of teeth as follows:

For utility

(a) Awls.
(b) Celts.
(c) Scrapers.
(d) Flaking tools.
(e) Fish-hooks.
(f) Handles.

(g) Spear and arrow points.
(h) Bird calls and whistles.
(i) Hoes.
(j) Netting needles.

For ornamentation

(a) Beads.
(b) Gorgets.
(c) Pendants.
(d) Hairpins.
(e) Combs.
(f) Ear ornaments.
(g) Cut animal jaws.
(h) Animal teeth.
(i) Bone and other imitation of teeth.

It is appreciated that this classification may not be complete, and it is well understood that outside of our state are to be found many other artifacts made of such materials other than

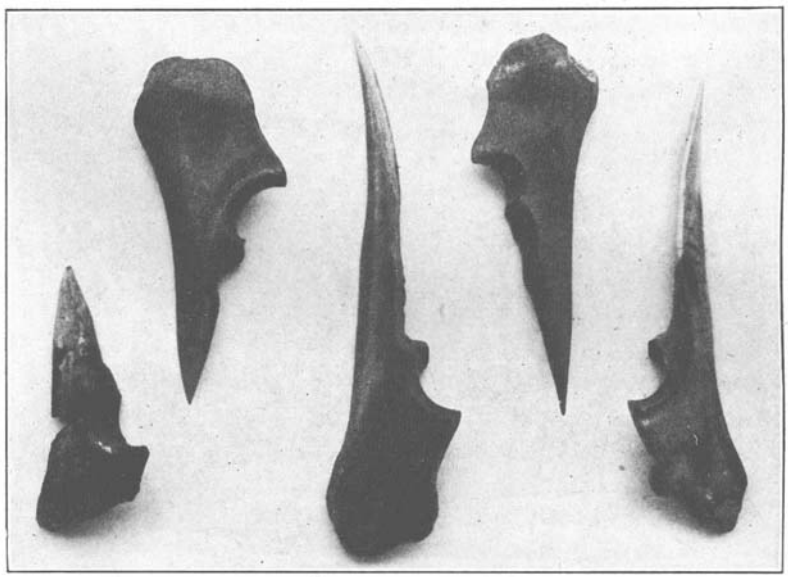

FIG. 83. BONE AWLS.
Made from the ulna of the deer. Specimens found in Hines' Cave, in the clay Mound and in the Jamison Mound.

these classified above. However, the classification seems sufficiently general to include all such artifacts found in Kentucky.

Perhaps the so-called bone awls were the most important household tools used in the domestic life of early man. The awl was certainly used to pierce holes in skins and to lace them together with thongs. In this way tents, garments and moccasins were made. The awl in some cases may have served as a weapon, and certain awls seem to have been used as our modern forks, or rather as skewers, to lift cooked food from camp kettles, and

possibly were used to convey food to the mouth. The awl was expected to stand rather severe usage, and therefore the maker generally sought a hard bone of compact texture.

An ideal bone for such purposes was the ulna of deer or elk, not only because of its compactness but because the articulatory surface made an excellent handle. Awls of this bone are found distributed generally over the state and were used alike by cliff and cave dwellers, the river folk and the mound builders. Another hard bone suitable for awl manufacture was the cannon-

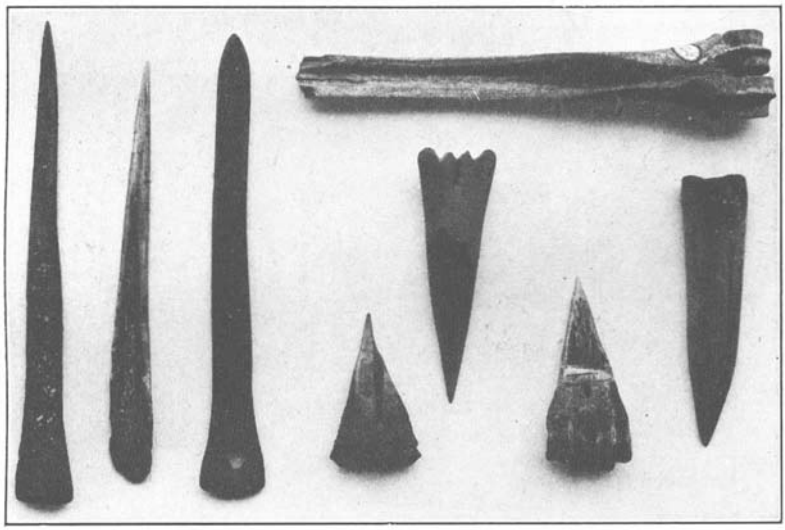

FIG. 84. BONE AWLS.
Made from the cannon bone of the deer. From the Yate's Cliff, Hardin County, Kentucky.

bone of the deer or other ungulate. This bone when split was capable of being worked into very efficient awls, taking on a very high polish.

A second method of converting the cannon-bone into an awl was to use the large end of the bone for a handle and cut away half of the wall, the remaining half being brought to a point. This type is well shown by the specimens in Figure 84 all from Yates Cliff, Hardin County, Kentucky. Attention is called to those specimens in the figure which show the joint end of the bone still remaining and the specimen in which the end of the

bone has been cut off and the base of the awl beautifully decorated by cross-hatching.

Still another bone much used in the manufacture of awls is the tarsometatarsus of large birds, and in particular that of the wild turkey. Figure 85 shows a variety of such awls coming from the various localities. The largest specimen was taken from a kitchen midden at Fox Field and was made from the tar-

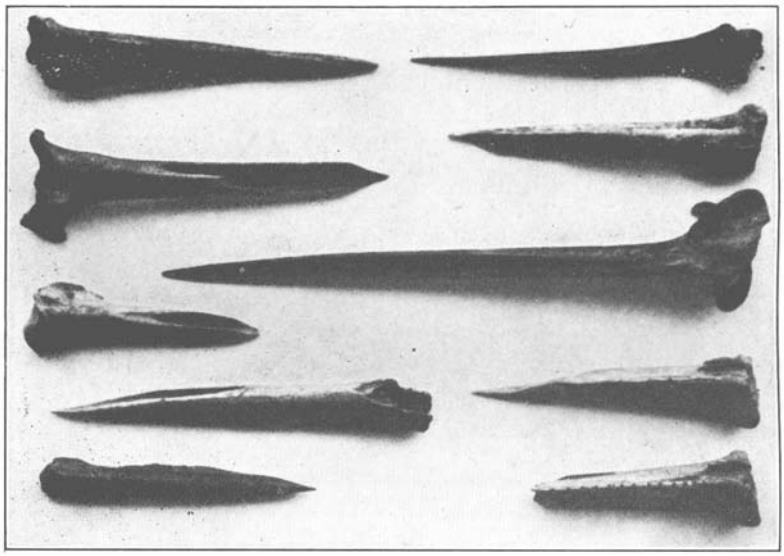

FIG. 85. BONE AWLS.
Made from the tarsometatarsus of large birds.

sometatarsus of some large bird probably the blue heron while the one immediately above it is from a wild turkey. The specimen on the lower right-hand corner of the figure shows decoration and notching.

Other special bones were used for awls. The longest awl shown in Figure 86 is made from the penis bone of the bear. Fish spines and ribs were often used as awls because they were already pointed, and were hard and compact in texture.

In the manufacture of celts for scraping and curing hides, and for other rough usage bone was often used. The third specimen in this figure is a typical bone celt. These are quite common, being reported by Smith, Milles, Moorehead and others from a

great number of sites. In general, however, bone must have been too soft to make an efficient scraper, which may account for the great predominance of stone celts, and for the fact that celts were made from the base of large horns. The upper right hand specimen in figure 87 shows celts made from the horn of the elk. The scraping edge in horn is much sharper and harder than bone even when hardened by heat which was often done.

Another form of scraper is not uncommon in Kentucky, and has been found in many places outside of our state. This is

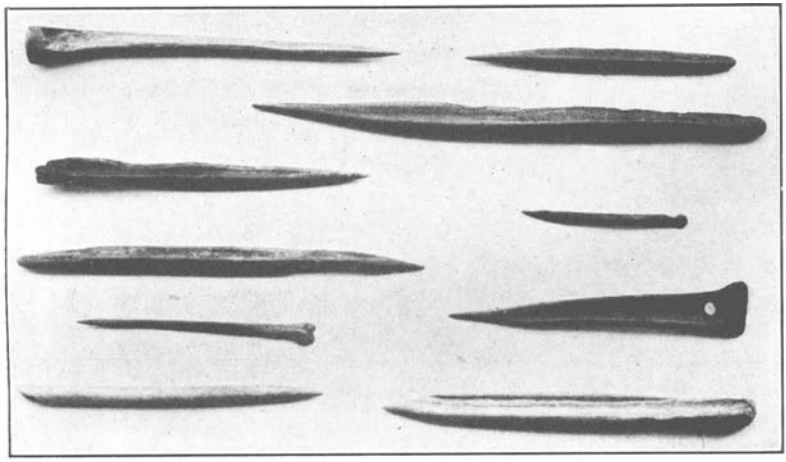

FIG. 86. BONE AWLS.
Made from fish spines and other small bones.

a type of scraper made from the metapodal bone of deer or other large mammal. The natural ends of the bone served as handles, it being a two handed tool. One half of the cylindrical wall was cut away for about half its length in the center and the remaining half ground to a nearly flat surface. Such a tool would have a double cutting edge and was doubtless used in a manner similar to a drawing knife, probably to dress and soften hides in the tanning process.

With a skin laid over a log such a double handed bone scraper would be a very efficient instrument. Excellent examples of this artifact are reported by Smith, from Fox Field, as made from the metapodal bone of deer. Another specimen taken from the collection of Hon. W. J. Curtis is shown in figure 87.

A very important tool of prehistoric man was the flaking tool made of a very hard solid bone or sometimes the tip of a horn. The manner of using this bone is discussed in the chapter on flint artifacts. The flaker is often found buried with the dead, and not infrequently is found in the hand of the skeleton. This has been interpreted to mean that early man attached great importance to this tool, and evidently felt that, provided with it in the spirit world, he would be able to make arrowpoints, spears, and other necessities.

These flakers besides being hard bone, are ground round at the ends and, before use, were laid in lye made from wood ashes to leach out all of the animal fat. This enabled the flaker to "take hold" of the flint when a chip was to be broken off by pressure. Flakers vary somewhat in length but are usually round in two sizes. The longer ones, from three to four inches long, were held in the right hand and used to exert a steady pressure on a flint edge. The shorter variety varying from 1.5 inches to two inches in length seems to have been used as a mechanic uses a "drift." That is, one end was placed against

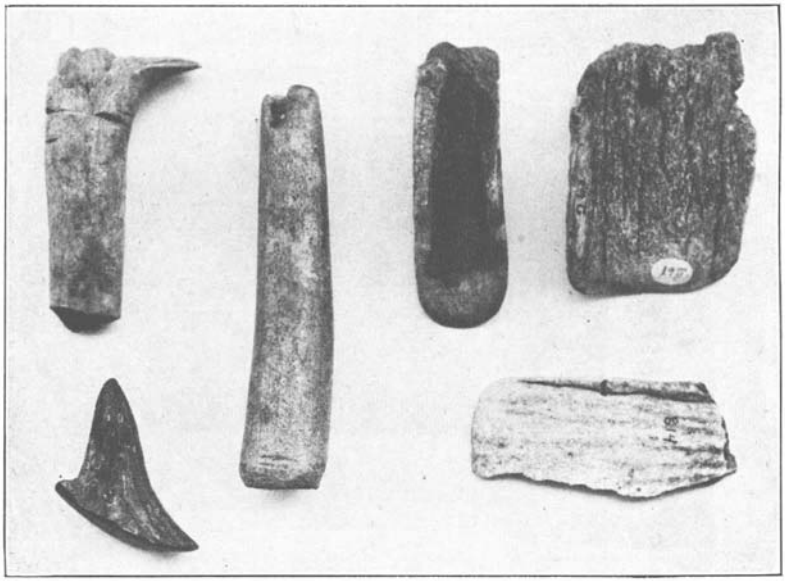

FIG. 87. CELTS.
Showing types made from bone and horn.

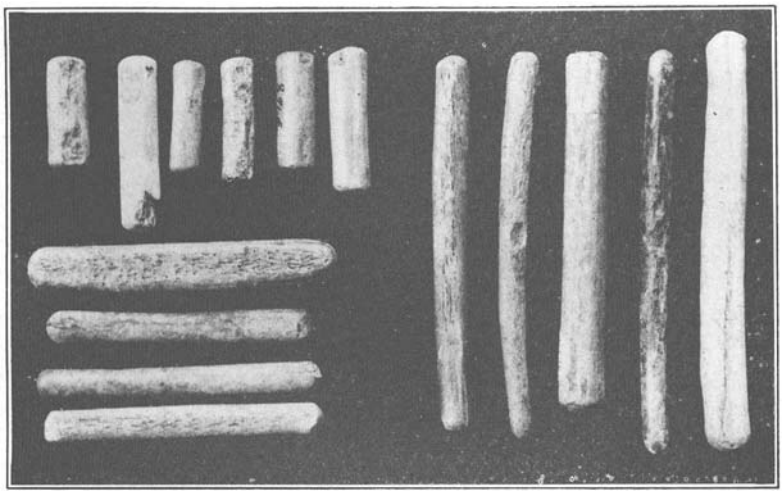

FIG. 88. BONE FLAKERS.
Used largely in the working of flint.

the flint edge to be chipped and when held at the proper angle the other end was struck by a hammer stone.

Thus the flint chip was broken off by a sudden blow rather than by steady pressure. That this explanation seems reasonable is attested to by observation that many of the shorter flakers, two inches long and under, show evidence of being hammered. There are many of them battered at the ends. Not only does this appear to be true of specimens collected by the authors but when any considerable number have been figured in other writings, many of the short specimens (and only those) show end battering.

Evidence seems to show that in certain sites outside of Kentucky the small flakers were sometimes hafted, by being placed in wooden handles. Sometimes these handles of wood were two or three feet long and fitted at one end with a cross bar of wood. This cross bar placed under the arm like a crutch, the bone f1aker being mounted in the other end of the main shaft, enabled the entire strength and weight of the body to be brought to bear on the f1aker and therefore on the flint chip to be dislodged. Perhaps such great pressure may account for the fact that so many f1akers are found battered at the ends.

Horn and bone served primitive man very efficiently in the making of handles for flint knives. The first specimen in figure 87 shows a section of deer horn used for that purpose. The practice of "hafting" flint knives must have been very much more common than might at first be supposed. Many large arrow points and so called spear points show evidence of having been used as knives after handles had been attached. That bone and horn were used is shown by the finding of such handles wherever flint knives are found in caves or elsewhere under conditions such as to have preserved the bone. Even today the Eskimo makes and uses bond handles on his stone knives.

Closely associated with horn handles were the so-called "netting needles" made of horn, reported by Moore from Indian Knoll. These needles, made from a section of horn with a hook cut in one end were thought by Moore to have been handles for the net mesh spacers found with them, and to have been used in weaving fish nets.

The time when man first began to use the bow and arrow is lost in the distant past but it is considered established that at least among the Eskimos the earlier bows were made of bone. The bones used were either the ribs of a whale or shark, or the jaw bones of large fish. If early man did invade our continent by way of Bering Sea, it is highly probable that his first bows were of bone rather than of wood. At any rate early man used arrow points of bone and horn long before he used flint. However, it is not to be supposed that when he began to chip flint that he discarded bone and horn arrows altogether. In fact the reverse is the case. Some very early cultures of our state used only horn and bone points. Later peoples used both horn and bone points and still others flint arrows entirely. In general the presence of arrow and spear points of bone and horn is to be regarded as evidence of rather primitive culture though not necessarily a very ancient one.

Figure 89 shows a variety of arrow points made from the tips of deer horns as well as tips cut off ready for manufacture, but still incomplete. There is also shown the remaining butt end of the horn which tells its own story. The deer was probably killed far from the village or camp and the tip end of the horns roughly broken off. Later, by the use of a sharp knife probably

of flint, a notch was cut around the horn at the proper place and the tip to be worked was broken off from the rough stump. This gave or was intended to give a fairly smooth base to the tip. A conical hole was then reamed out of the base to receive a pointed shaft to which the horn tip was probably attached by means of pitch or resin, or as has been found in some cases by asphaltum. It has been suggested that in the case of the use of such arrows for purposes of war, the tip was intentionally not very securely

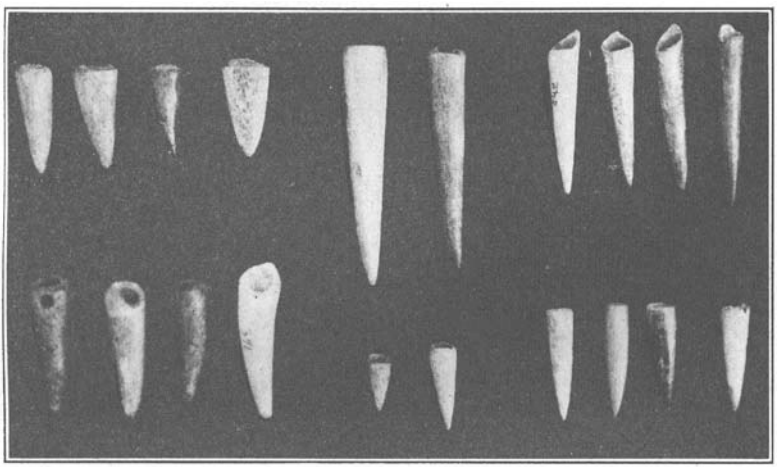

FIG. 89. ARROWPOINTS AND SPEARPOINTS.
Made from tips of horn and showing barbed, drilled and square bases.

attached to the shaft. Thus should the arrow reach its mark, the victim when attempting to withdraw the shaft would leave the point in the wound. That this is not fanciful, but actually did occur is abundantly proved by finding single arrow points and spear points with and in some cases embedded in the bones of skeletons.

Moore found in his excavation at Indian Knoll a spear point securely caught between two sections of the spinal column of a skeleton. In some cases however, as seen in Figure 89 the tip is drilled in the side, evidently to receive a pin for attachment to the shaft. It is to be noted that some of the finished points are cut square off and are scraped to a thin edge at the base, and are very sharp at the point. Others are cut off obliquely at the base and are so scraped that the basal edge acts like a barb

Perhaps here is to be found the distinction between the war arrow and the hunting arrow of primitive man. The sixth specimen in figure 89 shows a beautiful spear point from Fox Field, quite similar to the one reported by Moore.

Among the many other artifacts made of bone might be mentioned bone whistles or turkey calls. These are not very common, probably for the reason that they were made from

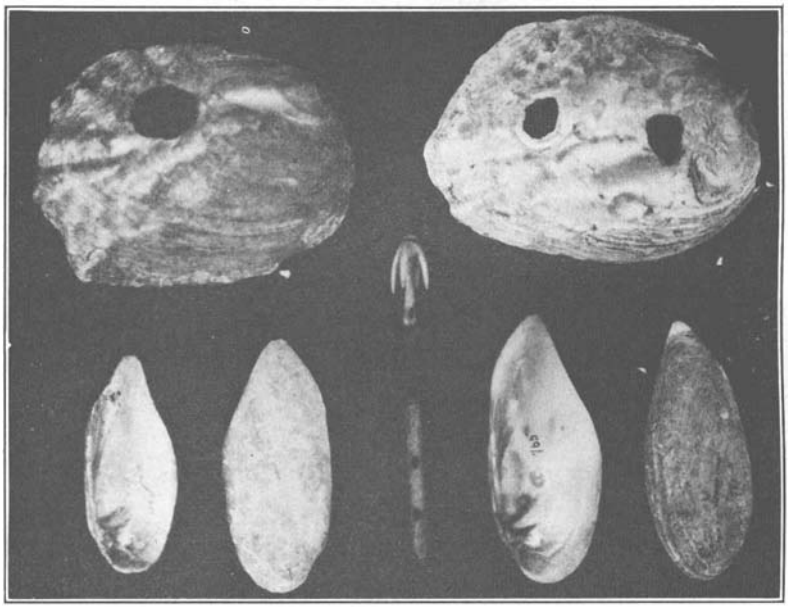

FIG. 90. SHELL AND BONE UTENSILS.
Shell spoons, shell hoes, bone whistle and bone fish-hook.

the small bird bones easily broken, and soon destroyed when exposed. These whistles vary from three to five inches in length and have from two to six well drilled holes about three fourths of an inch apart. The one shown in Figure 90 is from Fox Field and Smith figures many from the same site.

Fish hooks were made by early man by cutting a large bone obliquely. This practice seems to have been common throughout the whole Ohio River valley. Many have been found about the Ohio River at Louisville and Col. Bennett Young figures a variety of forms. Such hooks however are not common in excavations now, for their ability to withstand decay is very slight.

Fish hooks made from the teeth of deer or elk are found occasionally, and in a fair state of preservation. These are very carefully worked out and show much ingenuity. The fish hook shown, in Figure 90 is a four pronged hook found on the Ohio River near Maysville.

Shell hoes are not uncommon in Kentucky. They seem not to be peculiar to any location or culture. Such hoes are usually made from a very heavy mussel shell, a hole being broken in the center for attachment to a handle. Many specimens show wear, and evidently have seen considerable service.

Evidence is plentiful that in many villages and camp sites food was cooked in large pottery kettles. Probably the usual way to lift food from these pots was to use the valve of a large mussel as a spoon. Shells by long usage became worn on the edges, and show evidence of scraping on the pot walls. The shell generally selected was some long, slender variety of Unio and by use it developed a characteristic point and edge. Such shell spoons shown in Figure 90 are from Fox Field and from Reed's Cave.

BONE AND SHELL ORNAMENTS

The ornaments of early man were largely made of shell, bone and the teeth of animals, although stone played a considerable part in decoration and even pottery was sometimes used. It seems certain that in the primitive mind, ornamentation served two distinct purposes. First, ornaments such as hairpins, beads, ear ornaments, and pendants were worn as personal decorations. Second, gorgets, engraved pendants and animal teeth which were also engraved had a religious and ceremonial significance. This last class of objects being objects of veneration, were in many cases very carefully wrought, and were naturally buried with their owner at his death. By far the most common type of personal ornaments were beads, some quite small and delicate, others with the individual bead several inches long.

Bone beads were made by taking a long bone having the proper sized central hole and cutting it into sections of the desired length. This cutting was probably done with a flint knife. In Figure 91 a variety of bone beads are shown together with a bone marked off into sections cut nearly through. Before the final separation of the bead the free end was polished by rubbing,

using the bone from which it was to be cut as a means of holding it. Thus many bone beads show a very decided difference in their two ends. One end is well polished being the free end, the other end is left much rougher, being the end last cut off, and thus difficult to hold. After beads were worn for a long time, especially the larger ones, they show the result of rubbing together, which often renders them nonsymmetric, a non-symmetry which was evidently not produced in their manufacture. In one restoration we have a string of beads made of bone, taken from an extended burial in Fullerton Field. These beads vary

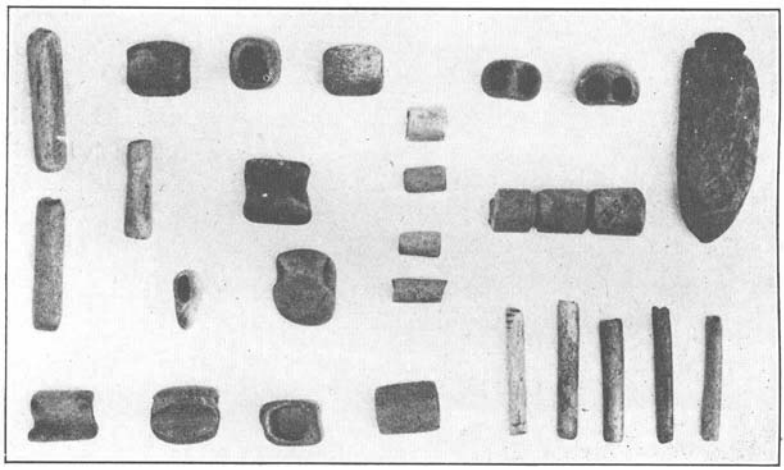

FIG. 91. BONE BEADS.
Showing various types from prehistoric graves. Specimen 354 is a notched bone showing the beads ready to be broken apart.

greatly in size and degree of polish and are but a small remnant of the personal decoration of this woman. Only some 113 beads could be restored. There probably were originally as many as 500.

It is to be noted that some of these beads were made from very thick walled bones having almost a square cross-section. Others were made from thin walled bones of circular section, still others from nearly flat bones suggesting the ribs of deer. These last were drilled non-symmetrically through the thick edge. A few of this group were double drilled. This last type has been reported at least once before from Kentucky, Hon. Wm. J.

Curtis having in his private collection specimens from Fox Field. Some of the beads shown in Figure 91 are from the Clay Mound, Nicholas Co., and are interesting from the fact that they are rather long as compared to the diameter of the hole drilled through them, and are almost triangular in cross section.

One of the most beautiful forms of large beads doubtless worn on a leather thong were those made from the large central column of marine shells. The use of such shells seems to have been quite common among all southern peoples on the Gulf and

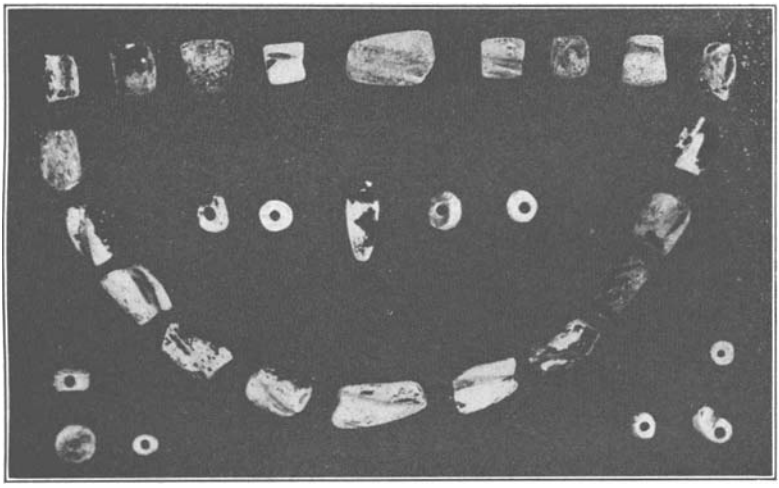

FIG. 92. SHELL BEADS.
Made from central column of marine shells.

Atlantic coasts, as shown by the excavations of Moore. That early man had intercourse with the sea either by trade or travel is proven by the presence of quantities of these large beautiful beads. Figure 92 shows the personal decoration of one man from Fox Field.

Shell beads were made in great quantities from flat disks cut from mussel shells. These disks vary greatly in size and thickness. In Figure 93 is shown a string of very small beads which composed the bead "skull cap" of the individual buried as a bundle burial in the center of the Clay Mound, Nicholas County, previously described.

These beads were probably not strung on a string but sewed on some fabric. Another very common form of bead is made from the fresh water olivella. These small shells were abundant in the streams of Kentucky and could be converted into beads by rubbing on a flat stone till a hole was worn in the large end.

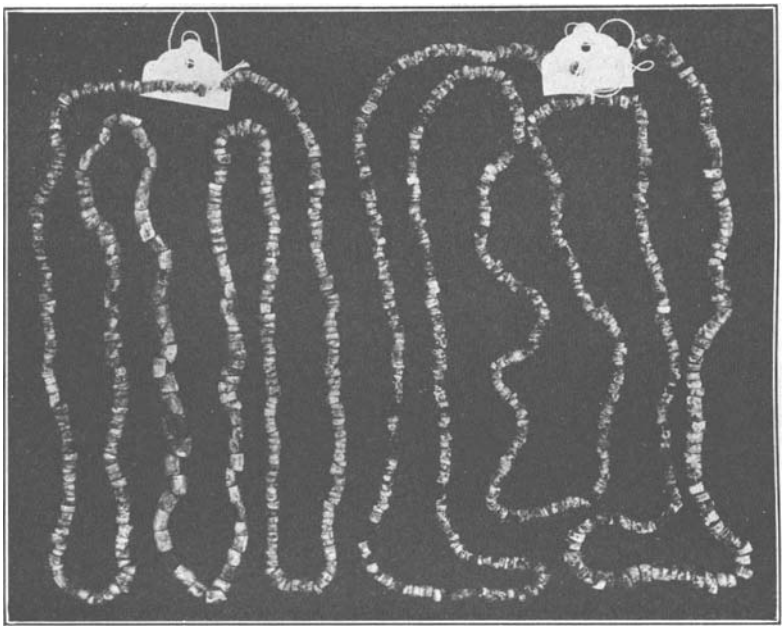

FIG. 93. SHELL BEADS.
The first string was found about the arms of a skeleton the shells in the second were from the head-dress of a skull—both from the Clay Mound.

They were probably sewed on fabric, and not used in strings. These shells are all about .35 inches long. Another smaller species (marginella) was also used, as shown by the small string from Hines Cave.

Another fresh water shell, *Oliva litterata* Lamarck, about one inch long was often used. Another use of fresh water shell appears in the graves in Hines Cave. The second row in figure 94 shows a group of these shells. They were not drilled and could therefore not have been strung but the large end of every one has been slightly worn off indicating some use. It has been suggested that a small slit was cut in a leather strap or garment

and such shells were screwed into the slit. That they could be held securely in a leather strap can be ascertained by trial today. They may have thus been used for ornaments without having been made into beads in the true sense.

Besides the recognized types of beads there is a great variety of worked shell forms which were evidently sewed to clothing or worn in association with beads. The third row in Figure 94 shows a variety of such forms. Their variation in shape seems to be endless, and while as a class they are fairly numerous, generally no two are alike and they probably represent the varied tastes of different individuals.

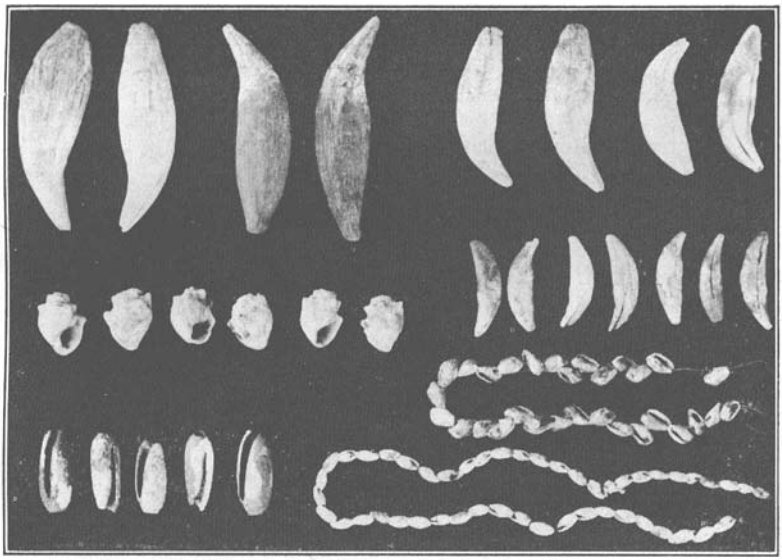

FIG. 94. TEETH AND SHELL ORNAMENTS.
Showing the unworked teeth of bear and wolf and the oliva, olivella and marginella shells used for beads.

Closely associated with the use of beads and many times found in connection with them are the various forms of pendants. Sometimes a single pendant forms the center of a string of beads. Sometimes a string of pendants forms a collar about the neck of the skeleton.

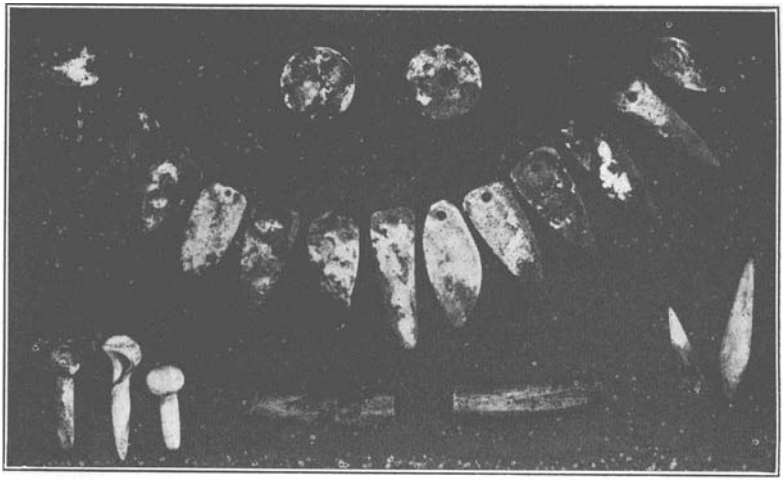

FIG. 95. SHELL DECORATIONS.
Necklace of shell pendants, ear ornaments and hair-pins.

Figure 95 shows a string of such pendants made from river mussel shells, if we may judge from the thickness and curvature. These fourteen pendants formed a collar on one (headless except as to lower jaw) individual in the Clay Mound, as previously reported. Figure 96 is a group of much more delicate pendants from a single grave in Fox Field. The drilling of the holes in these pendants is remarkably well done, in several of

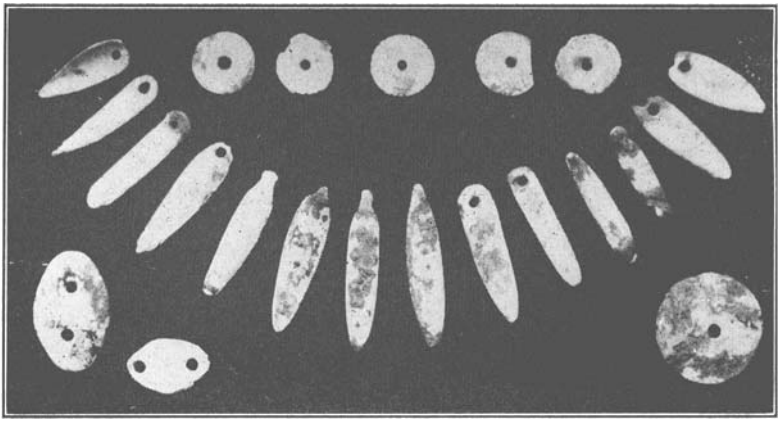

FIG. 96. SHELL PENDANTS.
Necklace of shell pendants from Fox Field.

them the hole is parallel to the face of the original shell from which the pendant is cut, rather than perpendicular to the shell face as would seem to be the natural way to drill such objects.

Pendants vary greatly in form and probably often had ceremonial or tribal significance. Figure 97 shows two pendants from the same grave in Fox Field which may represent animal claws as suggested by Smith who reported pendants from this site of identical form. The same figure shows two crescent pen-

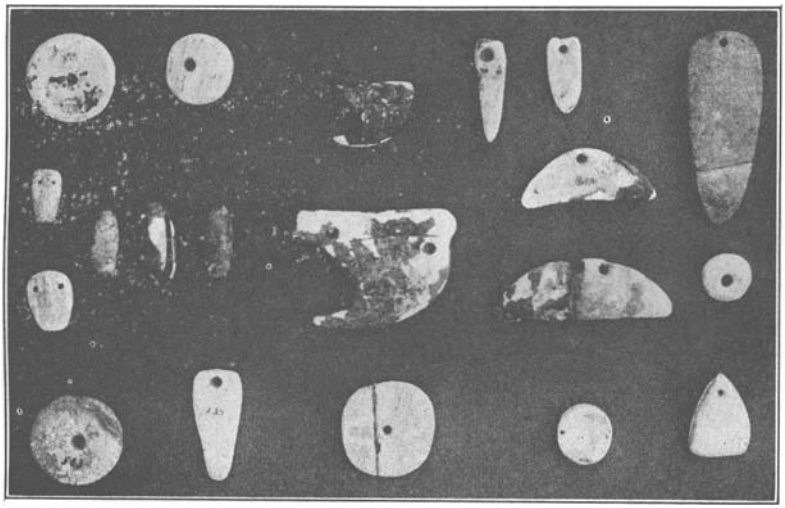

FIG. 97. PENDANTS AND DISKS.
Various forms of ornaments made from shell and bone.

dants from Fox Field similar to those reported by Smith who has to say of this site:

"The inhabitants of the village site were apparently the builders of the mounds as indicated by the similarity of the artifacts found in each. It will be remembered that the inhabitants of the Gartner Village were the builders of the mounds there. Shell crescents were found here in Kentucky and it will be remembered that Mills states the Baum site differs from the Gartner site only in the absence of shell crescents."

Pendants of bone, though rare, were sometimes made. One from Fox Field is shown in Figure 97.

By far the most ornate and perhaps the most treasured of the personal ornaments of primitive man were the so called “gorgets.” They were made from a variety of stone, sometimes

of beaten native copper and often of shell. The connection by trade or travel with the sea seems to have furnished the early Kentuckians with quantities of large marine shells from which large disks of almost flat surface could be cut. Some of these flat disks are as large as eight inches in diameter and from such disks in varying sizes shell gorgets were made. The plain gorget was usually drilled with two holes near the rim of the disk. Through these holes a thong of leather passed which was used to suspend the gorget over the breast of the wearer. The concave side of the original shell was usually worn outward from the breast. These simple gorgets were generally circular in outline and their edges very smoothly ground. Sometimes a central hole was drilled and from this hole a string hung down to carry beads or pendants below the gorget.

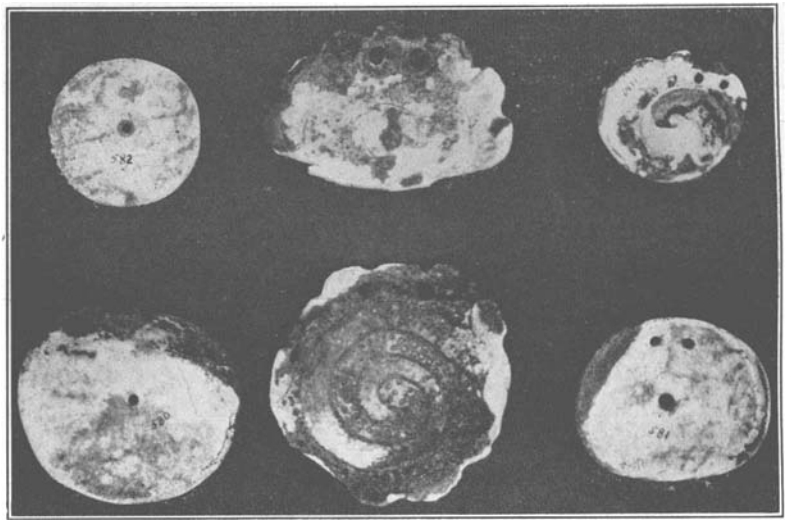

FIG. 98. GORGETS.
Shell decorations with holes for suspension. Note the rattlesnake design on the center gorget in the lower row.

Figure 98 shows typical gorgets of the simple type taken from the Clay Mound, one with a rattlesnake design, and figure 99 shows a large plain gorget from Fox Field made of a marine shell with beads. As has been suggested the gorget gave opportunity for primitive man to display his ability as a craftsman

in engraving his gorgets, and again it allowed him to display his symbols of veneration, charms and totems as indicated in the rattlesnake motive on the gorget from Fox Field.

Another gorget from the same field, having been broken when the field was plowed, and the remainder destroyed or lost,

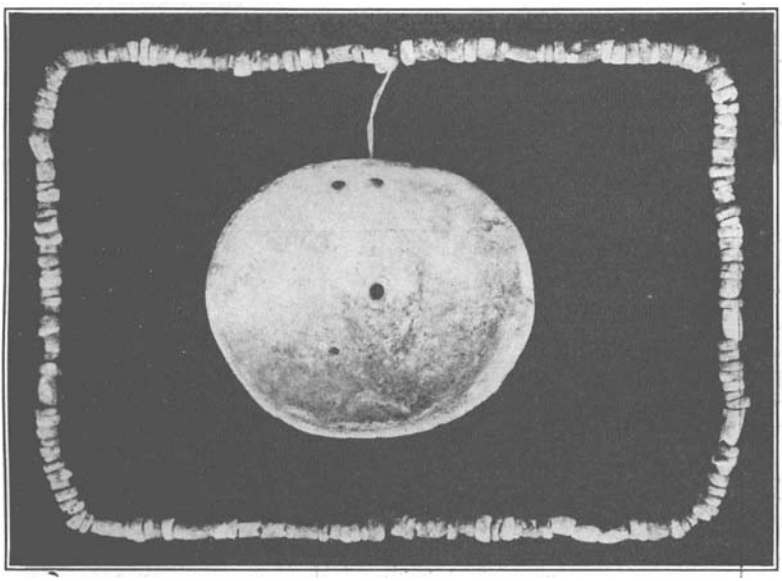

FIG. 99. GORGET AND BEADS.
Representing shell and bone decorations from Fox Field.

shows a characteristic type of scalloped edge. This fragment also shows the incised decoration known as the "triskele" frequently found in East Tennessee as well as Kentucky and usually associated with the known ancient or pre-Cherokee culture. Such gorgets of great beauty were reported by Harrington from Hiwassee Island near Dayton, Tennessee. On this point Mr. Harrington in "Cherokee and Earlier Remains on the Upper Tennessee River," 1922, Heye Foundation, states:

"As might have been expected, most of the pendants found were made of marine shells; one had been a fine circular gorget with scalloped edges on whose disintegrated surface may still be seen traces of an incised decoration, the "triskele" frequently found in eastern Tennessee. We were not successful in procuring any examples of the mask type of shell gorget, also well known, from this region, but a number of good specimens of these were found by Messrs Barnes and Benham during their digging on Hiwassee Island, some of which may

Still be seen in Lieutenant Benham's collection, along with a well preserved specimen of the "triskele' gorget.

Whatever other people or peoples may also have used the triskele, mask, and rattlesnake types of shell gorgets, the writer is convinced that the Cherokee owned and wore many of them, whether they actually made them or not. His reason for this belief lies in the fact that not only were they discovered in Cherokee graves by Messrs. Barnes and Benham, but that Mr. Moore found them associated with a series of artifacts, which the writer from his own studies considers typically Cherokee, on a site near Citico Creek in the vicinity of Chattanooga; and MacCurdy reports them so associated at the Brakebill mound near Knoxville."

It is interesting in this connection to note that the mask type of gorget referred to in this quotation is not unknown even in northern Kentucky. Figure 100 shows a splendid specimen from the Fox Field.

FIG. 100. MASK GORGET.
A remarkable type of engraved gorget from Fox Field.

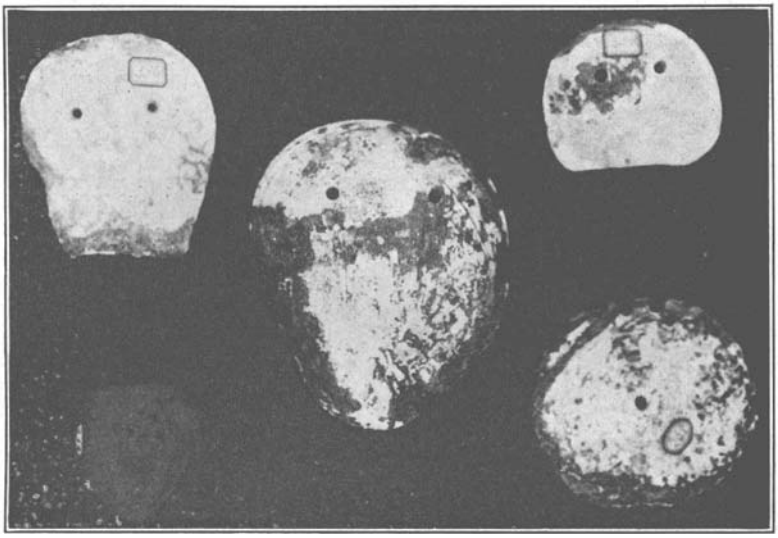

FIG. 101. MASK DESIGNS.
Gorgets and pipe with a peculiar mask motif.

This gorget is made from a section of a marine shell and very carefully engraved. It is heavily encrusted with oxide of iron from the soil, but the mask engravings still remain. The mask effect is obtained by grinding the shell in the general outline of a mask and on the convex face of the shell grinding off the surface to leave a prominent ridge down the center, which is evidently intended to represent the nose. The eyes are drilled holes, about each of which is a very peculiar figure which may have a significance suggested later. Many shell ornaments such as are shown in figure 101 seem to be replicas in miniature of the mask gorget. While it is granted that this mask form may have been used by the Cherokee and pre-Cherokee culture as suggested by Harrington, yet the mask motive is found in locations difficult to classify as Cherokee.

It may be interesting at this point to observe that figure 102 shows three gorgets made of the carapace of the box tortoise, each carefully ground and drilled with four to six holes. These gorgets were found on the breasts of one of two skeletons in a cave near Burnside, Pulaski County, Kentucky. Through the kindness of Mr. F. E. Bradshaw, cashier of the bank at Burn-

side, we obtained this record and the artifacts which are as far as the authors are aware the only gorgets made from the carapace of the box tortoise ever found in Kentucky. It is to be observed that here again in one of these gorgets we have the mask motive, *i. e.* a ridge for a nose, holes for eyes, and the general outline of the mask which happens to be in this case the natural outline of one section of the carapace. In this connection there has been shown in figure 101 a sandstone pipe typical of the Fort Ancient culture of northern Kentucky which again shows a ridge for a nose, holes for eyes, but most significant of all exactly the peculiar engraving about the eyes as appears on the mask gorget. This certainly can not be accidental. What the significance is can not be certainly known, but the figure strongly suggests the sex worshipers and may have a religious rather than a racial significance.

FIG. 102. SHELL GORGETS.
Made from the carapace of the box tortoise.

In addition to the large plain and decorated gorgets, described above, there are many small gorgets which might have been made from fresh water mussel shells. There is a variety of forms in these small gorgets and they occur over widely distributed areas. They are well made, carefully drilled and are usually found on the breasts of skeletons as if they had been suspended from the neck. Besides gorgets made of shell, bone was used where it was possible to obtain a flat bone of sufficient size. Reference has already been made to the gorget constructed from a human skull found at Fullerton.

Ear ornaments of shell appear in two forms in Kentucky. Figure 95 shows two shell disks taken from a skeleton in Clay Mound as previously reported. One of these disks was on each side of the lower jaw, the drilling would indicate that they were probably suspended from the lobe of the ear. A second type, common to the pre-Cherokee, is of the form of a shell pin several inches long, pointed at one end and terminating in a knob at the other. This type has been reported by Smith from Kentucky,

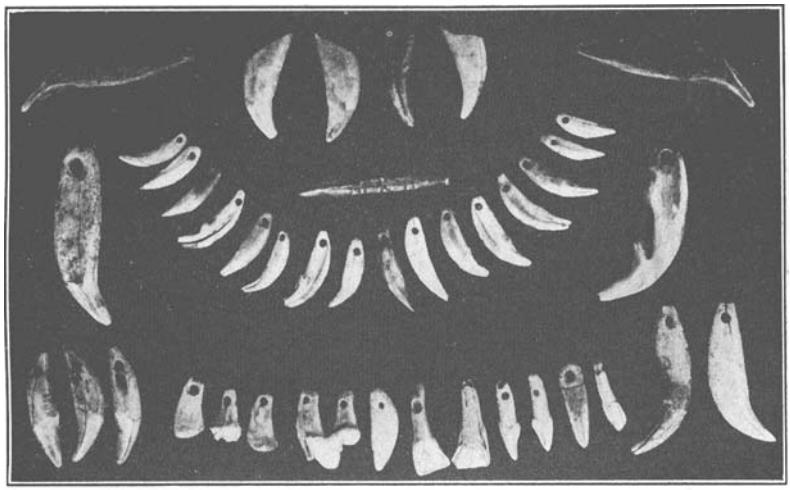

FIG. 103. ANIMAL-TEETH PENDANTS.
Teeth of various animals pierced and carved for use as ornaments.

by Harrington from Tennessee, and by Moore from Alabama and Florida. The Indian evidently slit the lobe of the ear and inserted the large shell pin, the knob pointing upward to the front and outward held the pin from slipping through the ear. A form of bone ear ornament was also used; figure 95 shows a pair of bone tubes about three inches long cut off square and the ends highly polished. These were also to be inserted in slits in the ear.

Hairpins made from long slender bones have been reported by Moore from Indian Knoll and figure 95 shows the remnants of a pair of bone hairpins found by the authors in the Clay Mound.

A very important item in the personal adornment of prehistoric man is the use made of the teeth of animals, especially the canine of bear and wolf, the incisors of elk and deer, and occasionally the molars of other animals. In general these teeth were drilled at the proximal end and used as pendants. Often these teeth were deformed from their natural elliptical

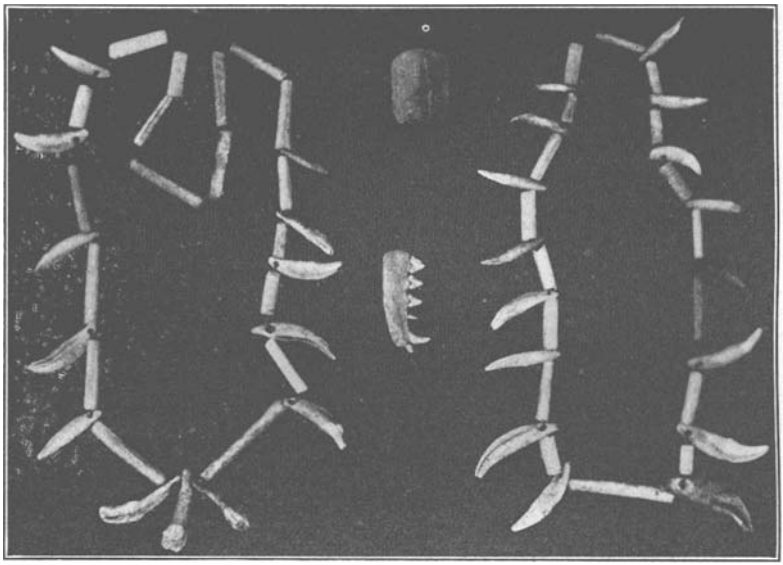

FIG. 104. CURIOUS NECKLACES.
An interesting type consisting of teeth and bone beads.

cross section by grinding to flat faces and again are often found engraved with incised lines in groups. Such engraved teeth were reported by Smith from Fox Field and figure 103 shows specimens from the same site. Animal teeth were worn singly, as pendants, or in groups of two or three or four in a cluster. When so used all the teeth of the group were similarly engraved. Occasionally a large number of undecorated teeth were used, evidently strung on a thong with a bone bead about an inch long alternating between the teeth. Figure 104 shows this arrangement made from the canine teeth of small animals and the incisors of deer. Such a string ornament was worn as a collar and always bound rather closely about the neck of the individual.

In Figure 103 is shown a group of three bear teeth similarly engraved from a grave in Fox Field, and the bear teeth engraved with the so-called Maltese Gross from the same site, have already been described in a previous chapter.

Besides animal teeth drilled as pendants a great many teeth were used with no drilling. Sometimes a groove was cut at the basal end which served the same purpose as a hole. Often, however, there are found in graves many animal teeth which show no working whatever. Their presence may mean that they were used as offerings to the dead at the time of interment or they were placed there to be converted into ornaments by the deceased when he should reach the spirit world. It is difficult to see how teeth unworked in any way could have served any purpose of ornamentation or utility.

A collection of such teeth of bear and wolf, all taken from graves, is shown in figure 94. Great interest attaches also to the finding of many canine teeth of bear, which have been cut in half transversely by grinding, the basal end being missing. Such findings are common, being reported by Moorehead from the Hopewell Group and by Smith from Kentucky. Such a very hard substance as the canine tooth of the bear would require a large amount of labor to cut, even with modern tools and must have been for primitive man a huge task. The fact that such cut teeth were comparatively common at once raises the question as to why they were cut and the equally interesting question as to how they were used after being cut.

It is thought that the finding of the upper bear jaw gorget at Fullerton Field, in the summer or 1926, as reported in chapter V gives not only the reasons for the cuttings but shows the method used. These cut teeth have long been a matter of speculation among archaeologists but we believe that when such cut teeth are found singly they represent the remains of a bone gorget, the bone tissue of which has long since decayed. Cut wolf jaws, previously described from Fullerton as forming a head dress, is a type of ornament closely related to the bear jaw gorget. Such gorgets were cut from the upper jaws of the bear while the wolf jaws, forming the head dress from both the upper and lower jaws. Such cut jaw ornaments have been reported pre-

viously by Mills. Figure 104 shows the jaw of a small cat taken from the general digging of Clay Mounds in Nicholas County, Kentucky.

In concluding the chapter on the use of bone and shell the discussion would be incomplete if attention were not called to the use of other materials to manufacture imitations of artifacts discussed in this chapter. In particular cannel coal, pipestone, (catlinite) and bone are often used to make imitation teeth. These black (coal), red (catlinite) and white (bone) teeth were

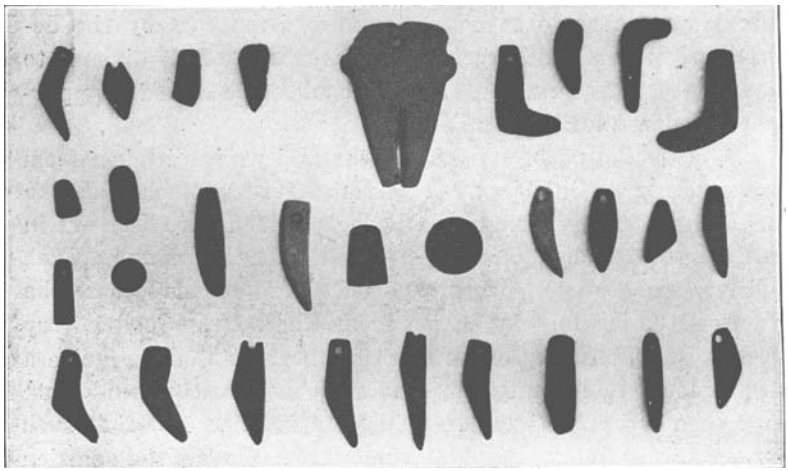

FIG. 105. IMITATION TEETH.
Made from cannel-coal, bone and catlinite.

evidently used along with the real teeth in forming collars, and must have added much to the color scheme of personal adornment. Figure 105 shows a group of cannel coal teeth with several catlinite and a few "bone" teeth. Some of the cannel coal teeth are engraved with the same system of parallel lines and cross lines as are incised on large bear tooth pendants. This propensity for imitation seems to have been shown only in the Fort Ancient culture group and is therefore very common at Fox Field.