THE USE OF ANIMAL LIFE BY THE MOUND-BUILDING INDIANS OF ILLINOIS*

FRANK COLLINS BAKER
University of Illinois, Urbana.

More than forty years ago a distinguished American zoologist, Dr. R. E. C. Stearns, wrote a very interesting paper on "Ethno-Conchology: A Study of Primitive Money," which was published in the Annual Report of the Smithsonian Institution (1887, part II, page 297). As a young man the speaker read this and other similar papers with great interest. As the years passed this interest grew. When the University of Illinois undertook the exploration of the Illinois mounds, particularly the Cahokia group, under the direction of Dr. W. K. Moorehead, one of the striking results was the discovery of the use of great quantities of mollusks, both of fresh-water and of marine origin, for a wide range of objects. With these mollusks were also the bones of deer and other animals, the whole indicating an extensive range in the use of animals in the domestic life of these primitive people.

One of the interesting features of the study of archeology is the attempt to reconstruct the everyday life of the people from the objects which they have left in their mounds or burial places. From a study of these we may picture the various uses to which the implements or artifacts were put: that this long sliver of bone was a needle for sewing clothing; that this shell with the inner whorls removed was a dipper; that this large clam shell with the perforation was a hoe for tilling the earth; and that this beautifully notched purple clam shell once adorned the ear, or nose, of some belle of the ancient community.

FOOD

Like many modern tribes of Indians and other more or less primitive people, it is probable that the women of the Mound Builders did a large part of the tilling of the fields and all of the domestic work, while the men were hunters and warriors. Hunting doubtless furnished a large part of the meat supply, which con-

* Contribution from the Museum of Natural History, University of Illinois, No. 54.

sisted of deer, raccoon, and possum among mammals, and such birds as the wild turkey, ducks, geese, and other large species. Fishing certainly was carried on, as bones of these denizens of the water have been found in the mounds. Even turtles and frogs formed a part of the diet.

River mussels doubtless formed a large part of the food supply of these Indians, for the shells of clams, either scattered or forming large masses of kitchen-midden, or refuse heaps, have been found in considerable numbers. A kitchen-midden of clam shells was found in one of the mounds in the Havana region which was of such a size as to almost confuse the zoologist as to their origin, the mass forming, apparently, a perfectly natural bed, like the Pleistocene formations so common in parts of the state.

Among the vertebrate animals used for food, the Virginia deer appears to hold first place, for the bones of this animal are found in all mounds. In the Cahokia group they occurred very abundantly, many of them being broken, apparently for the purpose of obtaining the marrow. That other mammals were esteemed is suggested by the presence of the remains of the opossum, the raccoon, and several squirrels. Even the beaver was used. Whether or not the great bison was used for food cannot be definitely stated from the bone relics, as only the teeth and the horns of very young animals have thus far been found.

Among birds, the American turkey was evidently a favorite, and long before our eagerly anticipated Thanksgiving Day was first set aside by proclamation, these early Indians may have celebrated, in the fall, a day of thanksgiving to the Great Spirit for a good crop and abundant game. With wild fowl plentiful and population relatively small, there could be a choice of bird food, and the presence of the bones of mallard and black ducks, blue-winged teal, several species of geese, and the trumpeter swan indicates the discriminative taste of these people. Of fish, the river carp and buffalo, as well as the fresh-water drum, were caught, and probably other large fish were also snared. Frogs, snapping turtle, and painted turtle indicate a liking for the same delicacies that more modern man now seeks.

It is probable that the large river snails, such as Campeloma and Anculosa, were used, as well, perhaps, as the larger fresh-water snails such as Lymnaea and Planorbis. Land snails are rare in the mounds, and there is no indication that they were used as food by the Illinois Indians, although many primitive people have used

these succulent mollusks, as attested by the finding of hundreds of specimens in the mounds of the Aurignacean people of the Old Stone Age in Algeria, by the expedition of the Logan Museum of Beloit College. Our larger land snails, such as the white-lipped snail *(Polygyra albolabris),* would be fully as good for food as were the species contained in these mounds. Evidently the Mound Builders were not as far advanced in this respect as were these earlier people.

IMPLEMENTS AND ARTIFACTS

Not only were deer and other animals useful for furnishing the food supply, but their bones and hard parts supplied the raw material for many artifacts and implements of great value in the domestic economy. The Virginia deer was, perhaps, the most useful animal for this purpose, its bones being especially well adapted for the making of several essential tools. The heel bone (calcaneum) made an excellent awl or punch, the flat posterior portion forming a handle. The arm bone (ulna) also made an awl with a somewhat longer punching end, the bone below the upper end being ground to a long, fine, sharp point. Some awls or punches from the Chandler mound near Havana measured a foot in length, these being made from the metacarpal or metatarsal bones of the legs.

Even the lower jaw formed an excellent punch when the anterior end was rounded and pointed, the rear portion of the ramus forming a convenient handle. Several such tools were found in the James Ramey mound of the Cahokia group. One lower jaw, found in the Sawmill mound at Cahokia, was evidently used as a chisel or celt, the anterior end of the ramus being smoothed and squared. While the majority of the awls and punches were made of the leg bones, objects thought to be scrapers were made from portions of the pelvis, ribs, dorsal vertebrae, and shoulder blade. Very fine, long, and narrow bone objects are classed as needles and were made from the lower leg bones of the Virginia deer. One of the best of these objects, a slender piece six inches long and an eighth of an inch in diameter, was found with a skeleton in the group of mounds known as 19, 20, and 21. And the significant fact of this find is that the skeleton was that of a woman!

Mollusks of various kinds are the most common objects in the mounds of Illinois. The use of river mussels as food has already

been noted. Some of these mussels were made into spoons or scoops, often cut and ornamented. Broken shells were used as a flux with clay and formed a cementing medium in the making of pottery. Several specimens of a large clam were found that had been cut squarely across the shell, a hole being made in the center near the hinge line, and this is believed to have been a hoe.

Perhaps the strangest mollusks present in the mounds in fairly large numbers are the marine snails. These are not fossils deposited near the mounds by Pliocene or earlier seas, as has been thought by some people, but are all recent species, now living in the waters of Florida and the Gulf of Mexico, as well as the West Indies. The sea is now 500 miles away. A striking fact is that all species are of a tropical character, none inhabiting the colder shores of New England or New Jersey. All are distinctively those species living in the warm waters of Florida or the Gulf of Mexico.

How did the Mound Builders of Illinois obtain these shells in such quantities? It is possible that there might have been some transportation up and down the Mississippi and Illinois rivers and some barter in this way between the tribes of the Gulf coast and those of Illinois. But it appears more probable that they were obtained by barter from the tribes to the east or south, and that this bartering passed through many hands and many tribes before reaching the prairies of Illinois. That the barter may have been from Florida northwestward is suggested by the presence of similar species in the Hopewell mound of Ohio and in the mounds in Calhoun County, Illinois. That this trading was also of an extensive nature is attested by the abundance and diverse character of the species represented. Marine shells were much more highly prized than were the common mollusks found in the rivers and creeks of Illinois.

The uses made of these marine shells were various and their utility obvious in many cases. The great conch (Busycon), which attains a length of a foot, made an excellent dipper or scoop, or a drinking cup, when the inner whorls were removed and a portion of the body whorl cut away, the long canal affording a convenient handle. Such dippers occurred in the Cahokia group, in the Chandler and Neteler mounds of the Havana group, and in other places. The solid center axis of this conch also provided material for drills and punches. This species of conch *(Busycon perversus)* is to be regarded as one of the most valuable objects of raw material available to the Mound Builders.

Perhaps the most striking object of this class of animals is the large helmet shell, or Cassis, which occurs rather rarely in the Hopewell mound and in the mounds in Calhoun County, Illinois. This shell grows to about ten inches in length and has a diameter of about seven inches. When the inner whorls and a portion of the last whorl are removed, it makes a useful water jar or container. That this shell is rare and difficult to obtain by the Mound Builders, is shown by the fact that but two specimens occur in the Calhoun County collections and but one in the Hopewell collection of the Field Museum in Chicago. The presence of this Cassis in these two places suggests trading or barter by an overland route rather than by the Mississippi River.

PERSONAL ADORNMENT

Personal adornment was evidently considered as much of a virtue among the Mound Builders as it is among the swains and belles of today. Some of this was probably simply for the purpose of enhancing the personal charms of the wearer, but among the men, at least, it also undoubtedly indicated the standing of the individual in the tribe as regarded his personal bravery, either in conquering some wild animal or in victory in warfare. In the Neteler mound in the Havana group, great numbers of the canine teeth of the black bear were found in connection with burials. The teeth were either whole or split longitudinally, and all were pierced with one or more holes for suspension about the neck as a necklace. As many as fifty of these teeth were found in one grave, indicating that the owner, possibly a chief, had killed some twelve bears. As the killing was done with primitive weapons, arrows or spears, this feat is to be ranked as one worthy of note.

The strangest objects found in the Neteler mound were the cut and squared lower jaw of a human being and those of an Indian dog, both pierced with two holes, apparently for suspension about the neck. These were probably used as amulets or charms and are apparently rare in Indian mounds. Whole upper jaws with the palate were found in the Dickson mound near Lewistown, Fulton County.

Beads of various kind are common objects with all primitive people, and they were made in abundance and apparently commonly worn by the Illinois Mound Builders. Some of the large discs made from the marine conch may have been used as money

and strung for this purpose, but the beads for pure adornment were much smaller and were made from a variety of objects, all mollusks, however. The flat side of the marine conch, Busycon, was a favorite source of supply. Other marine shells were also used for this purpose, as the fasciolaria, the strombs, and the olives. The solid axis of the conch was much used, resulting in a thick, rounded, button-like object, pierced with one hole in the center.

Snails, both marine and fresh-water, were used abundantly and could easily be made by grinding one side of the body whorl until a hole was formed into the inner cavity. These shell beads were strung by passing a cord through the natural opening and the artificial hole. Several species of small marine snails were used in this manner, as the marginellas, periwinkles, and small conchs. The small river snails, however, appeared to be the favorite for this purpose, and thousands of the little Anculosa have been found in the mounds of the Cahokia group and in Calhoun County mounds. The larger Campeloma snails were also used, but not to so great an extent. The fresh-water mussels were often used as a pendant, many such being found which had been pierced with two holes, apparently for this purpose. Some of these shells occurred with burials apparently as a sort of bracelet or anklet on the legs above the ankles.

Beads made from barouque pearls of the fresh-water mussels occurred in great numbers in the Chandler and Neteler mounds in the Havana group. They were carefully bored and must have made striking ornaments when strung and hung about the neck of some dusky maiden. The boring of the holes in these small pearls must have been a slow task and required a high degree of skill on the part of the workman. These pearls did not occur in the Cahokia or Calhoun mound groups.

DOMESTIC ANIMALS

No domestic animals such as have been used by modern Indians have been found in the mounds. The nearest approach to such is the presence of the bones of Indian dogs somewhat resembling certain breeds now found in Alaska and in Greenland and eastern America. How the dog came to be among the Mound Builders of Illinois is not perfectly clear, but it may have arrived here by way of British America through barter with the intervening tribes. Dogs of various sizes are known from shell mounds in Maine which are pre-Columbian in age.

ART

The ethnologic scale of a people is largely indicated by their art—the objects which they have made by the use of thought—in other words, their culture. This is largely indicated by pottery, which is now considered one of the best indicators of the degree of culture among primitive people. But it may also be indicated by other objects, and among the Cahokia Mound Builders several such made of shells indicate a rather high degree of culture. One outline Indian head, made of the flat side of a pink heel-splitter mussel was found in the Sawmill mound. The outline is perfect, the nose characteristically Indian, the chin sharp and prominent. In the same mound a shell gorget of peculiar design was found, made from the same species of river mussel. The beautifully worked ear pendant found in the James Ramey mound, mentioned before, made from the purple river mussel called the spike, is another example of primitive art. In this even the bright purple color has been retained after a lapse of several hundred years. In one of the Calhoun County mounds there was found a small object which indicates a well-developed cultural taste. Made of the side of a marine conch shell, it is about two inches long, disc-like, one end having the head of a bird beautifully carved in profile.

That the makers of the mounds so abundant in Illinois were observant students of nature is strikingly shown by their use of natural objects as ornaments on the rims of their pottery. Such were found quite commonly in the Cahokia group and included clay heads of birds, suggesting the spoonbill duck, some of the game birds, as prairie chicken, perhaps the passenger pigeon, and a mammal, possibly intended for a wild cat. Whole jars or vases known as effigy pottery also occur in some of the mounds. An effigy jar about four inches high was found in the Rose mound near Bluff City, Schuyler County, the upper part representing the head of an owl, possibly a screech owl, the eyes and nose being graphically shown. Another owl-like jar was found near Pittsburg Lake, Cahokia region, which represented the top of an owl's head, only the ears being shown. Frogs and other animals are known to have been used as effigies in other places in Illinois, particularly on pipes of both clay and stone.

SYSTEMATIC LIST OF SPECIES

I have appended a systematic list of the different species of animal life used by the Mound Builders, as shown by the material in the museum of Natural History of the University of Illinois, gathered for the most part by the parties under the direction of Dr. W. K. Moorehead during the past five years. A single collection of large size was made in Calhoun County many years ago and exhibited at the World's Columbian Exposition in Chicago in 1893. This list indicates strikingly the wide use made by these primitive people of the natural resources about them, which helped to make life easier and to enable them, also, to give expression to cultural aspirations, which apparently were strongly developing.

For assistance in this list, the writer is indebted to the following colleagues:

Bird bones,—Dr. Alexander Wetmore, Assistant Secretary, Smithsonian Institution, and Director, U. S. National Museum.

Mammal bones,—Mr. Gerrit S. Miller, Curator, Division of Mammals, U. S. National Museum.

Fish and reptile bones,—Dr. Alvin R. Cahn, Department of Zoology, University of Illinois.

Bird, fish, and mammal bones,—Dr. L. A. Adams, Department of Zoology, University of Illinois.

A summary of the animal life used by the Mound Builders shows the following numbers of species among the different groups:

	All Mounds Studied	Cahokia Group	Illinois River Group
Mollusca:			
Marine species	12	10	3
Fresh water mussels	23	16	12
Fresh water snails	4	4	2
Total Mollusca	39	30	17
Vertebrates:			
Pisces	3	3	1
Amphibia	1	1	0
Reptilia	2	2	0
Aves	8	8	0
Mammalia	12	7	9
Total Vertebrates	26	21	10
Grand Total	65	51	27

The predominance of the Cahokia group over those on the Illinois River is noteworthy, especially in the use of marine mollusks and of birds.

Systematic records of the use of animal life by prehistoric Indians are rare. Among those noted is one by F. B. Loomis and D. B. Young (Amer. Jour. Science, iv, XXXIV, pp. 17-42, 1912) which lists the relics of animal life found in the shell heaps of Maine, including 39 species, of which 18 are mammals, 5 birds, 7 fish, 1 turtle, 1 frog, and 7 mollusks. Sea urchins are mentioned as forming food rarely. The following species mentioned also occur in the western mounds in Illinois: deer, black bear, raccoon, beaver, and domestic dog. Among the birds, only the brant is common to both areas. As in the Illinois material, a large part of the animal life was used as food, although deer and other bones were used for making harpoons, fish hooks, and needles. Dr. W. K. Moorehead states that bone implements and artifacts were common in the Hopewell mound group, Ross County, Ohio. Bear teeth, split and perforated, were abundant. Carvings of high merit made on bone were numerous. No mention is made, however, of the use of any animals as food. The use of fossils, particularly the large tooth of the huge fossil shark from South Carolina, the *Carcharodon megalodon,* is noteworthy. None such have thus far been found in the Illinois mounds, as far as is known to the writer (*see* The Hopewell Mound Group of Ohio, Field Museum of Nat. Hist., Anthro. Ser., Vol. VI, No. 5, 1922, by Warren K. Moorehead).

PHYLUM MOLLUSCA

MARINE GASTROPODS

Busycon perversa (Linn.) Conch Shell. Left-handed.

The most abundant marine shell in the mounds. Found in all mounds examined, including the Cahokia Group, near East St. Louis, and those in Mason, Schuyler, Calhoun, and other counties bordering the Illinois River. Uses: dipper or cup made by removing inner whorls; awls or punches from center axis; beads from heavy center axis; rounded discs from thinner outer or body whorl; small specimens smoothed, polished and grooved for suspension as a pendant about neck with necklace, possibly of beads; whole spire (flat) of shell forming rounded disc, use unknown. In Calhoun Co., a fine bird-head effigy was carved from the side of a shell of this species.

Busycon carica (Gmelin). Conch Shell. Right-handed.

Not as abundant as *perversa*. Used as dipper. Found only at Cahokia.

Busycon pyrum (Dillwyn). Pyriform Conch Shell. Right-handed.

Rare. Found only at Cahokia. Used as pendant, a hole being drilled in the lower part of the canal.

Fasciolaria gigantea Kiener. Giant Spindle Shell.

Cahokia group only. Portion of center axis, use not apparent.

Fasciolaria distans Lamarck.

Cahokia group only. Several whole shells, use not indicated.

Strombus pugilis alatus Gmelin. Stromb or Conch Shell.

Cahokia group only. Two specimens, one whole; one piece of spire whorls, apparent use as pendant or ear ornament.

Cassis madagascariensis Lamarck (= *Cassis cameo* Stimpson). Cameo Shell, Helmet Shell.

Calhoun County. Two fine specimens of this large cameo shell were found in the Calhoun County mounds many years ago. These specimens have the inner whorls removed, thus making the shell an excellent receptacle for holding water, grain, or any small material. Fragments of this shell occur in village debris near the Don Dickson mound, Lewiston group.

Murex pomum Gmelin. Rock Shell or Purple Shell.

One specimen was found with burial in the Rose mound, Bluff City, Schuyler County. Its use is not apparent.

Oliva litterata Lamarck. Olive Shell.

Cahokia group only. One specimen with top of spire removed, possibly used as pendant.

Littorina irrorata Say. Periwinkle.

Cahokia group only. One whole shell. Use not indicated.

Marginella apicina Menke. Marginella Snail.

Cahokia group only. Many shells occur with a hole ground on one side, this, with the natural aperture, forming two holes making it possible to string the shell in the form of beads.

Rangia cuneata Gray. Marine Clam Shell.

Cahokia group only. Three specimens, one left valve, two right valves. Use not indicated.

AQUATIC PELECYPODS

Mussel shells probably obtained mainly from the Mississippi River and the Illinois River.

Fusconaia ebena (Lea). Niggerhead Mussel.
Cahokia group, rare. Use not indicated.

Amblema costata Raf. Three-ridge.
Common. Cahokia group only. One specimen used as hoe.

Amblema rariplicata (Lamarck). Blue-point.
Common in mounds in Mason and Schuyler counties. Used for food.

Amblema peruviana (Lamarck). Blue-point.
Rare in Cahokia group. Use not indicated. Possibly for food.

Megalonaias gigantea (Barnes). Washboard.
Cahokia group only. Several specimens apparently used as hoes.

Quadrula quadrula Raf. Maple-leaf.
Cahokia group only. Use not indicated.

Quadrula cylindrica (Say). Rabbit's Foot.
Cahokia group only. Rare. Use not indicated.

Quadrula pustulosa (Lea). Pimple-back.
Havana mounds. Not common. Use not indicated, possibly for food.

Tritogonia verrucosa (Raf.) Buckhorn.
Havana group. Rare. Use not indicated.

Cyclonaias tuberculata (Raf.) Purple Pimple-back.
Cahokia group, made into shell hoe; Havana group, possibly for food.

Plethobasus cyphyus (Raf.) Bullhead.
Havana group. Rare. Use not indicated. Possibly food.

Pleurobema coccineum solida (Lea). Small Niggerhead.
Havana group. Common. Probably used as food.

Elliptio dilatatus (Raf.) Spike or Lady-finger.

Cahokia group; Mounds on Illinois River. This is the commonest river mussel in the mounds and occurs abundantly in all groups. It was evidently largely used as food, occurring in great numbers in kitchen-middens; it was also made into ornaments. A fine specimen of this shell occurred in the James Ramey mound, Cahokia group, which had been made into an ear ornament. It retained in a remarkable degree the delicate purple color of the species. In the Rose mound, Schuyler County, a specimen had been worked for some ornamental purpose, but had evidently not been finished.

Elliptio crassidens (Lamarck). Elephant's Ear.

Havana group. Probably used as food.

Truncilla truncata Raf. Deer-toe.

Cahokia group only. Use not indicated.

Plagiola lineolata (Raf.) Butterfly.

Havana group. One specimen. Possibly used as food.

Proptera alata megaptera Raf. Pink Heel-splitter.

Cahokia group. An effigy representing an Indian's head was found in the Sawmill mound and an ornamented shell gorget of peculiar design was found in mounds 19, 20, 21. A left valve of this species was found in the Rose mound, Bluff City, Schuyler County. It was unworked. This mussel, although very abundant in both the Illinois and Mississippi rivers, appears to have been little used by the Mound Builders.

Ligumia recta latissima (Raf.) Black Sand Shell.

Cahokia group only. Rare. Possibly used as food.

Lampsilis anodontoides (Lea). Yellow Sand Shell.

Cahokia group only. Rare and use not indicated.

Lampsilis fallaciosa (Smith) Simpson. Slough Sand Shell.

Cahokia group, rare. Havana group, rare. Use not indicated.

Lampsilis siliquoidea (Barnes). Fat Mucket.

Cahokia group only. Not common and use not indicated.

Lampsilis ventricosa occidens (Lea). Pocket-book Mussel.

Cahokia group, rare. Havana group, rare. Probably used as food.

Lampsilis ovata (Say). Pocket-book Mussel.

Cahokia group. Several large valves of a mussel appear referable to this species rather than to *ventricosa,* to which they were previously referred. The shell is thinner than *ventricosa* and the heavy posterior ridge is more like *ovata* than *ventricosa.* These have been worked into scoops or spoons. In the Rose mound, Bluff City, Schuyler County, a number of mussels occur which are referable to this species. One specimen is large, about four inches long, and was evidently used as a scoop. It was found with a burial, in mound no. 13. In mound no. 12, associated with burial no. 1, there were eighteen shells which had been cut to small size (1½ to 2 inches long) and a hole drilled at each end. These were found around the leg of the skeleton above the ankle. The shell from which they were cut is probably the *Lampsilis ovata,* as two large shells from the Rose mound are of this species. The same species occurs with burials in the Dickson mound. It is interesting to note that this species is not found in either the Illinois or Mississippi River, but occurs in the Ohio River. The Indians must have obtained the shells by barter, as in the case of the shells found in the Cahokia group.

USE OF PEARLS

In the Kamp mound near Kampsville, Calhoun County, and also in the Neteler mound near Havana, Mason County, there were found quantities of barouque pearls of the river mussels, in association with burials. These had been made into beads by boring a hole through the center of the pearl. Pearls were also found in the Dickson mound, and consisted of barouque, hinge, and some free pearls. None were observed in other mounds and none occurred in the Cahokia group.

FRESH WATER SNAILS

Anculosa praerosa (Say). Round River Snail.

This is one of the most abundant snails in the mounds, used in all cases for the purpose of making beads by grinding a hole in the side of the shell, which, with the natural aperture, provides two holes and forming a bead which may be strung. Very common in the Cahokia group; in Calhoun County; and in the Hagans Mound, Browning, Schuyler Co. It was not observed elsewhere.

Campeloma ponderosum (Say). Heavy River Snail.

Several specimens of this large river snail occurred with Calhoun County material. They were bored to form pendants on a necklace. Two specimens were found in the James Ramey mound, Cahokia group, use not indicated.

Campeloma integrum (Say). River Snail.

Three specimens of a Campeloma occur with material from the Wells Village Site which are referable to this species rather than to *subsolidum* (= *crassulum*) as before recorded. They were used as beads.

Pleurocera acuta tracta (Anthony). Slender River Snail.

A few specimens of this snail occurred in the James Ramey mound, Cahokia group. Use not indicated.

In the Cahokia group there were many specimens of mollusks found which were evidently introduced with the building material, and hence cannot be considered as of archeological value. Their presence, however, should be recorded, and they are listed below:

Stagnicola palustris elodes (Say)
Stagnicola reflexa (Say)
Helisoma trivolvis (Say)
Planorbula armigera (Say)
Physella gyrina hildrethiana (Lea)
Viviparus contectoides W. G. Binney
Anodonta grandis Say
Helicodiscus parallelus (Say)

PHYLUM CHORDATA

CLASS PISCES

Ictiobus bubalus (Raf.) and *Carpiodes carpio* (Raf.).

Opercular bones of a species of buffalo fish were found in the James Ramey mound village site. Smaller opercular bones believed to be of the river carp were also found. These suckers were evidently used as food.

Aplodinotus grunniens Rafinesque.

The pavement-like lower pharyngeal teeth of the fresh-water drum were found in the Tippetts village site, Cahokia group; and in mound no. 6, Havana group, Mason County.

Unidentified fish vertebrae also occurred in the James Ramey mound, and the operculae of an unidentified fish in the Sawmill mound.

CLASS AMPHIBIA

Rana species.

The lower jaw of a small species of frog was found in the James Ramey mound.

CLASS REPTILIA

Chelydra serpentina (Linn.)

The hooked lower jaw of a snapping turtle occurred in debris from the James Ramey village site. A portion of the plate of the plastron was found in the Edwards mound.

Chrysemys cinerea (Bonn.)

Several fragments of the plastron of the western painted turtle were found in the James Ramey village site.

CLASS AVES

Anas platyrhynchos Linn.

Humerus of mallard duck from base of mound west of Merrill house, at depth of 3½ feet. Broken bones which may be of either *Anas platyrhynchos* or *Anas rubripes* (the black duck) were found on the James Ramey mound. Two humeri and a tibio-tarsus are represented.

Querquedula discors (Linn.)

Humerus and tibio-tarsus of the blue-winged teal were found in the James Ramey mound.

Chen caerulescens (Linn.)
Chen hyperborea (Pall.)

Metacarpal, humerus, radius, and ulna bones of geese occurred in the base of a mound west of the Merrill house at a depth of 3½ feet; the Saw Mill mound; the James Ramey mound. Dr. Wetmore says that perhaps both the blue and the lesser snow goose may be represented, and as the bones vary somewhat in size it is quite possible that this may be so.

Branta canadensis (Linn.)

Humerus, metacarpal, radius, and tibio-tarsus bones of the Canada goose occurred in the James Ramey mound.

Cygnus buccinator Richardson.

A single bone, the lower end of the metatarsus, of the trumpeter swan, was found in the James Ramey mound.

Gallinula galeata (Licht.)

A lower part of a tibio-tarsus of the Florida gallinule was found in the James Ramey mound.

Anatidae, species unknown.

Several bones of ducks occurred in the James Ramey mound which are not determinable.

Meleagris gallopavo silvestris (Vieill.)

Metacarpal, tibio-tarsus, and tarso-metatarsus bones occur in the James Ramey mound. Some of the leg and wing bones have been broken, evidently by the Indians during consumption of the turkey as food.

CLASS MAMMALIA

Didelphia virginiana Kerr.

Four rami of lower jaws of the opossum with the teeth intact were found near Abbott mound no. 2, near Naples, Scott Co., in a fireplace 3½ feet beneath the surface of the ground.

Odocoileus virginianus (Bodd.)

The bones of the Virginia deer were found in all mounds and in many village sites. They were most abundant in the Cahokia group. Many of the leg bones had been broken to obtain the marrow. The remains of this animal have also been found in the Havana group, Mason Co., near Bluff City, Schuyler Co., near Naples, Scott Co., and several places in Calhoun Co. This deer was the most used animal for the manufacture of bone implements. The leg bones, especially the metarcarpals or metatarsals, were used in making punches, awls, scrapers, etc. The calcaneum was a favorite for making short punches because of the excellent handle formed by the end of the bone. Longer awls were made from the ulna. Dorsal vertebrae and portions of the pelvis made good scrapers. The ribs were made into scrapers, and in one example, a small celt. Lower jaws were fashioned into punches and chisels or celts. A shoulder blade (scapula) made a scraper. Spike horns of young deer made good awls or punches. Some of the leg or arm bones (humerus or femur) were curiously incised and carved on one end, the use not being clear. In short, there was scarcely any bone of this animal that was not used for some purpose. This animal may be considered the most valuable natural asset of the Mound Builders, furnishing both food and material for useful implements.

Cervus canadensis (Erxleben).

A specimen of the lower end of the metacarpal bone of the elk, or Wapiti, curiously incised, was found in the James Ramey mound.

Bison bison (Linn.)

Several molar teeth of the American bison, or buffalo, were found in the fireplace near the Abbott mound number 2, near Naples, Scott Co. Relics of the bison are rare in the mounds. What are taken to be horns of very young bison were found in mound number 6 of the Havana group.

Sciurus carolinensis Gmelin.

A humerus of the southern gray squirrel was found in the James Ramey mound.

Sciurus niger rufiventer (Geoffroy).

A humerus and a femur of what is probably the western fox squirrel occurred with other bones in the fireplace near the Abbott mound number 2.

Castor canadensis Kuhl.

A portion of the right lower jaw of a beaver was found in the fireplace near Abbott mound number 2.

Canis cf. familiaris Linn. Variety.

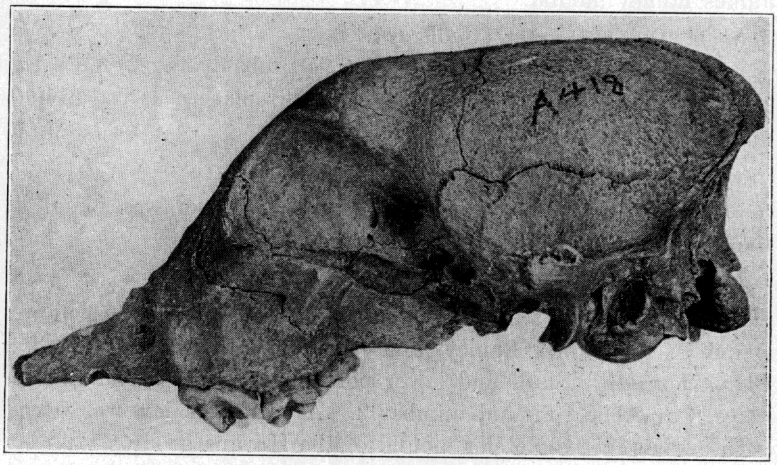
Skull of adult animal and left ramus of lower jaw of puppy found in the James Ramey and the Sawmill mounds of the Cahokia group. Skull and lower portion of radius found in fireplace near Abbott mound number 2. A cut lower jaw was found with burials in the Neteler mound of the Havana group.

Comparison of these relics of dog-like animals indicates clearly that they do not belong to the coyote or prairie wolf, the frontal bones being much higher and the contour of the top of the head with a greater angle over the supraorbital region. The carnassial tooth is different and like that of the domestic dog, and there appears to be no question but that these animals were varieties of *Canis familiaris,* or common dog. A skull submitted to Mr. Miller was identified as that of a dog.

The presence of these apparently undoubted bones of the dog raises the question as to how they came into the possession of the Mound Builder Indians. Most of the mounds are believed to have been occupied in pre-Columbian times before the white man traded European material with Indians, and it is not likely that the dogs could have been acquired in this manner.

In the paper previously quoted, by Loomis and Young, reference is made to the finding of several types of dog in the shell heaps or kitchen midden of Maine (p. 25). These are believed to antedate the coming of the white man and to be upwards of 300-500 years old. The Illinois dogs appear to be like the type D of Loomis and Young, having a dental length of about 80 mm., and the head is rather short and chunky. Mention is made of similar dog remains from burials in Cross Co., Arkansas. As these authors state, there should be a systematic study made of the dogs found in the Indian mounds and shell heaps.

It is possible that the dogs might have been obtained by barter from more northern regions where the Eskimo tribes possessed



Skull of domestic dog from Sawmill Mound, Cahokia Group. (About 2/3 natural size.)

dogs, and the remains in the mounds may represent variations of these ancestors. References to the presence of dog remains in the mounds are rare, apparently, although no systematic attempt has been made to consult all of the literature.* Moorehead states that they did not occur in the Hopewell group in Ohio.

Taxidea taxus (Schreber).

A complete skeleton of the badger was found in the Rose mound number 13, near Bluff City, Schuyler County. It was buried

* Dr. Carl E. Guthe, of the University of Michigan, informs me that the dog is found in the early cultures of the Southwest and that it is believed to have been domesticated in the Old World and brought over with the aborigines during their migrations. This may be equally true for the mound-building Indians of the Mississippi Valley and would account for the presence of the bones of this animal in the mounds. Since the present paper was written, a rather complete skeleton of a dog has been found in material from the Hagan mound, Schuyler County, associated with a human burial.

on its right side with the head bent back over the left side, at a depth of two feet. This is apparently an actual burial and not a case of cave-in of a burrow. Human burials occurred in this mound at depths of two and three feet, but the significance of the badger burial is not apparent. Perhaps it served some ceremonial purpose.

Ursus americanus Pallas.

The left ramus of a lower jaw of the black bear was found in the fireplace near the Abbott mound number 2. A pierced canine tooth of a young animal was found in the Sawmill mound, Cahokia group. In the Neteler mound, near Havana, Mason County, great quantities of the canine teeth of the adult animal were found in connection with human skeletons, usually about the neck, where they had been worn as a necklace. Many of the teeth had been split longitudinally, and all were bored with either one or two holes. Bear teeth also occurred in the Dickson mound.

Procyon lotor (Linn.)

Disconnected rami of the lower jaws of the raccoon occurred in the James Ramey mound of the Cahokia group, and in the fireplace near the Abbott mound number two of the Illinois River group.

Homo sapiens (Linn.)

The use of human bones is rare in the mounds of Illinois. The most noteworthy and surprising use of these was a lower jaw found in the Neteler mound near Havana. This was evidently the jaw of one individual, the right and left ramus treated separately. Both are squared to be used as pendants, the right ramus with two holes near the ascending portion at the rear, and the left ramus pierced near the front end. With this jaw occurred the lower jaw of a domestic dog similarly squared and bored for suspension. In the Dickson mound, near Lewistown, Fulton County, a whole upper jaw with the palate was found. Just what significance these human bones may have in the culture of the Mound Builders is not perfectly clear, though they were probably in the nature of amulets or charms. In the group of three mounds, known as 19, 20, 21, in the Cahokia group, there occurred a portion of a human tibia which had been worked into some sort of tool or ornament.

ACKNOWLEDGMENT

The following plates were supplied by the University of Illinois Press.

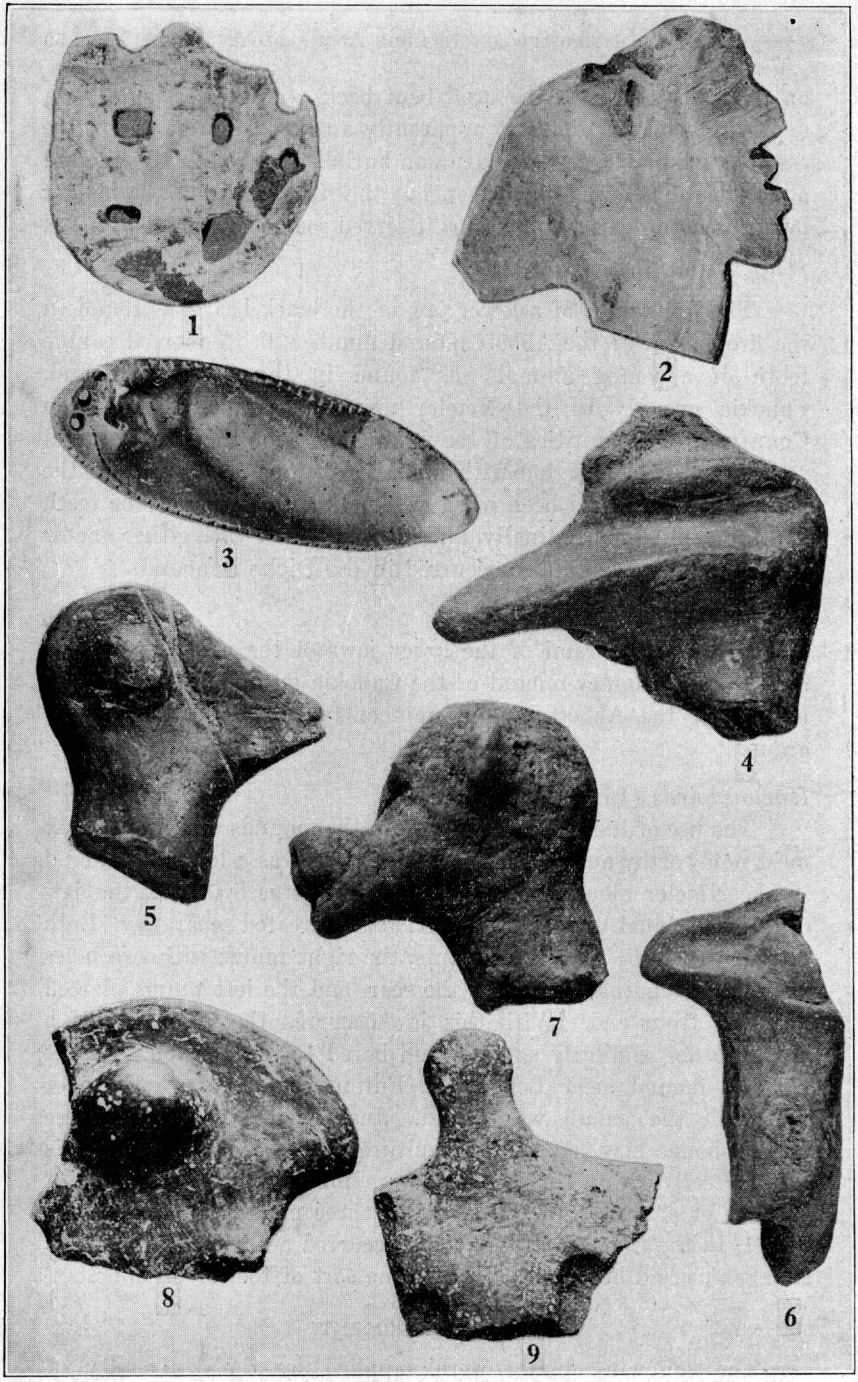
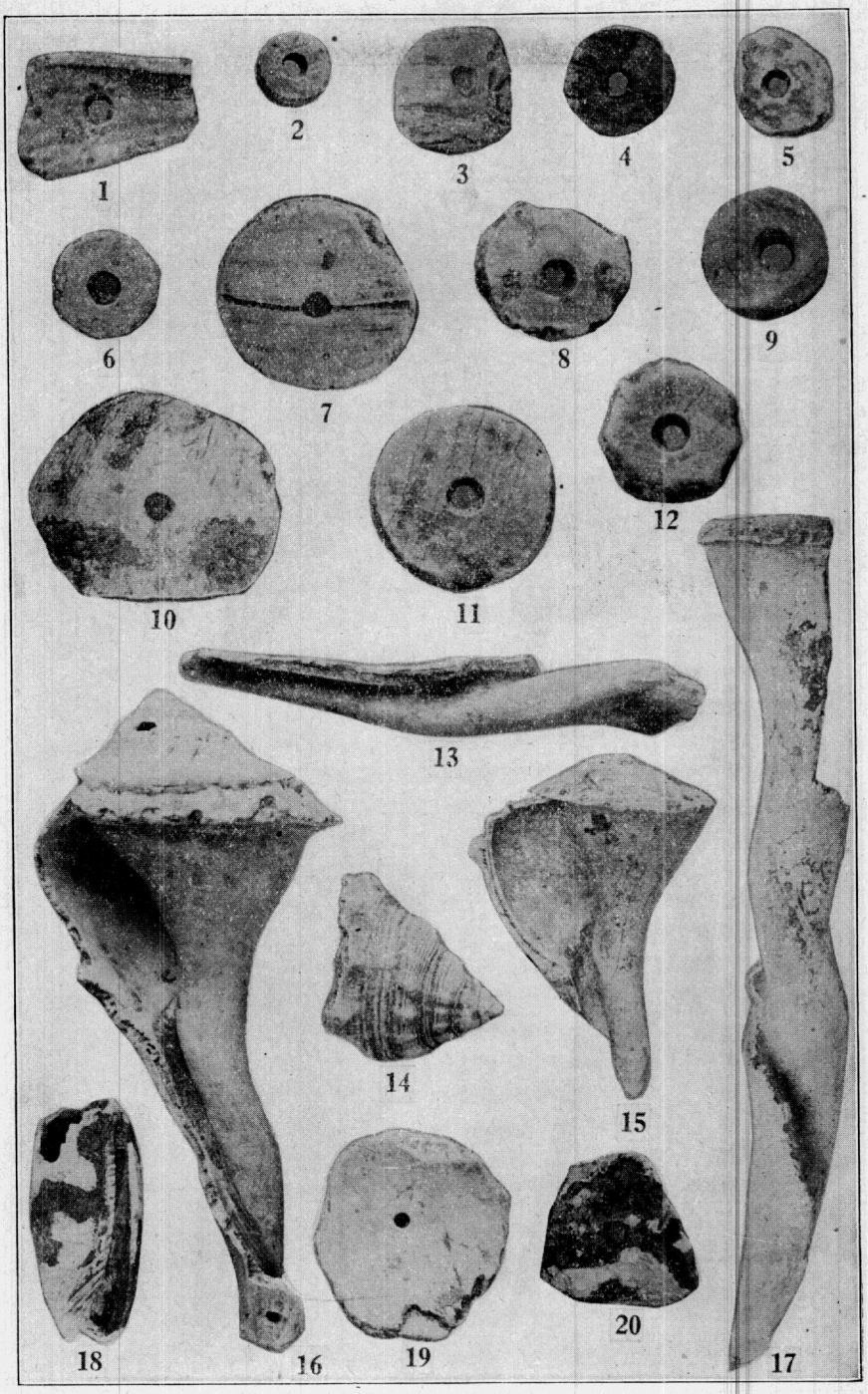


FIG. 1. Shell gorget. FIG. 2. Shell effigy made from shell of fresh water mussel. FIG. 3. Nose or ear ornament made from shell of fresh water mussel *(Elliptio dilatatus)*. FIG. 4. Clay bird's-head effigy. FIGS. 5, 6. Clay bird's-head effigies. FIG. 7. Clay mammal-head effigy. FIG. 8. Portion of clay pot or ornament. FIG. 9. Ornament on rim of pot. (¾ natural size.)



FIGS. 2, 4, 9, 12. Shell beads made from marine conch *(Busycon)*. FIGS. 5, 6. Shell beads made from fresh water mussels (A330). FIGS. 1, 11. Shell ornaments from marine *Busycon*. FIGS. 7, 8, 10, 20. Shell ornaments made from fresh water mussels. FIGS. 13, 15, 17. Shells and central axis of marine conch, *Busycon perversa*. FIG. 16. Marine conch, *Busycon carica*. FIG. 19. Ornament made of side of *Busycon* shell. FIG. 14. Marine shell, *Strombus Pugilis alatus*. FIG. 18. Marine olive shell, *Oliva literata*. All from James Ramey Mound, between 8 and 23 feet below surface. (FIGS. 1 to 12, about natural size; 13 to 20, about 3/5 natural size.)

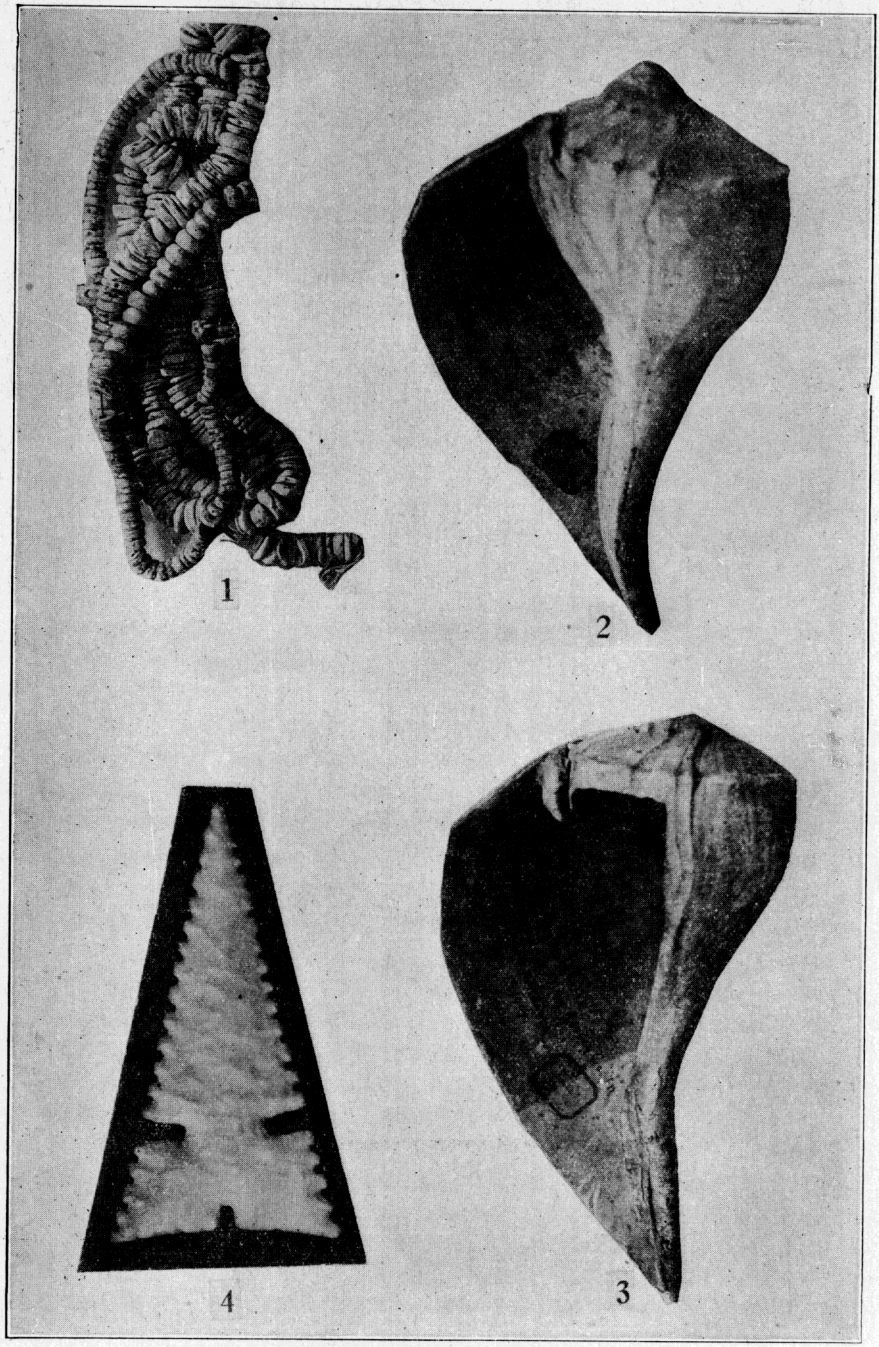


FIG. 1. String of shell beads cut from busycon conch. FIG. 2. Marine conch shell, *Busycon carica*. FIG. 3. Marine conch shell, *Busycon perversa*. From the Monticello Seminary collection. (¼ natural size.) FIG. 4. Arrowhead of quartz, unusual workmanship, found on the surface of Monks Mound. (Natural size.)

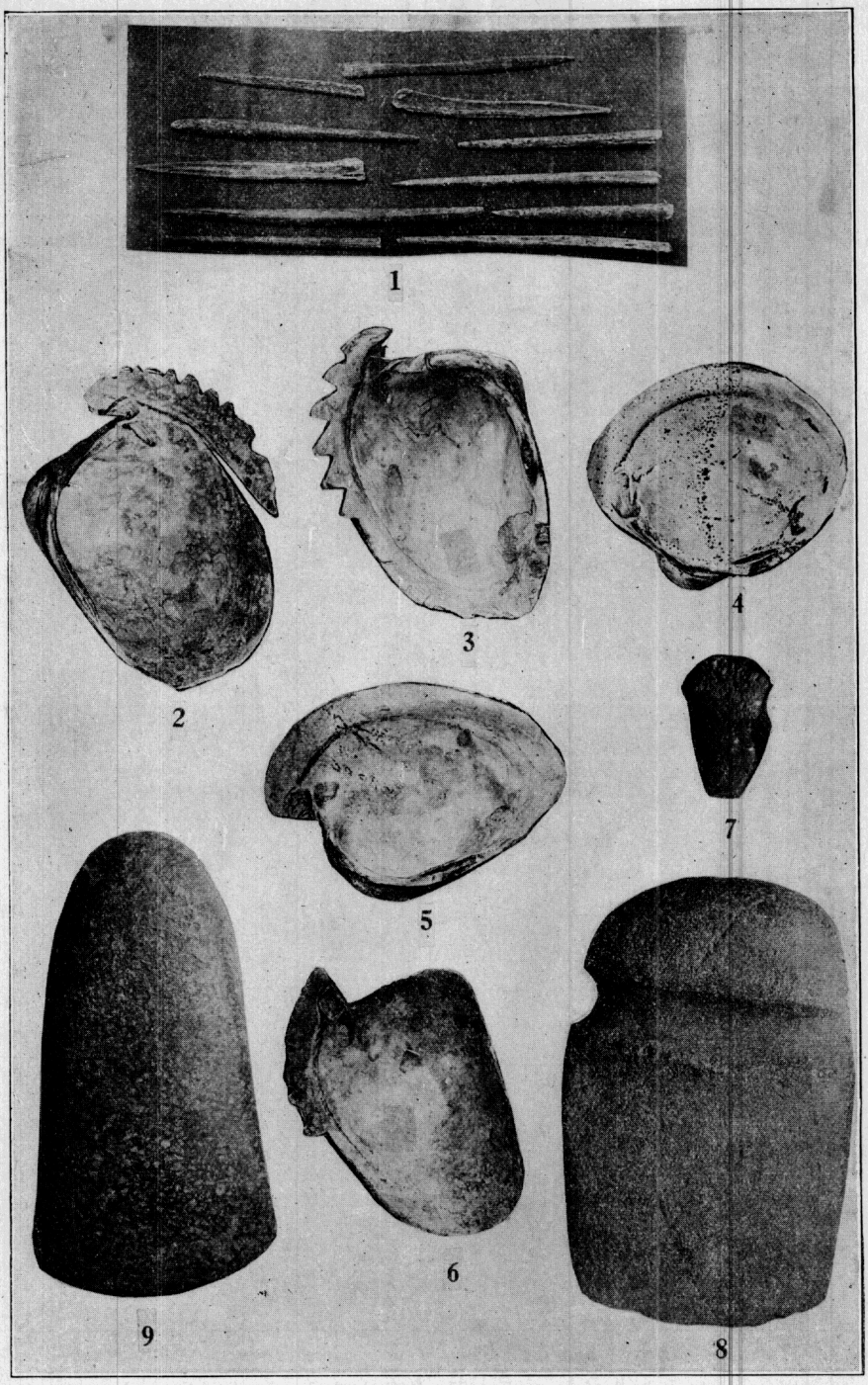
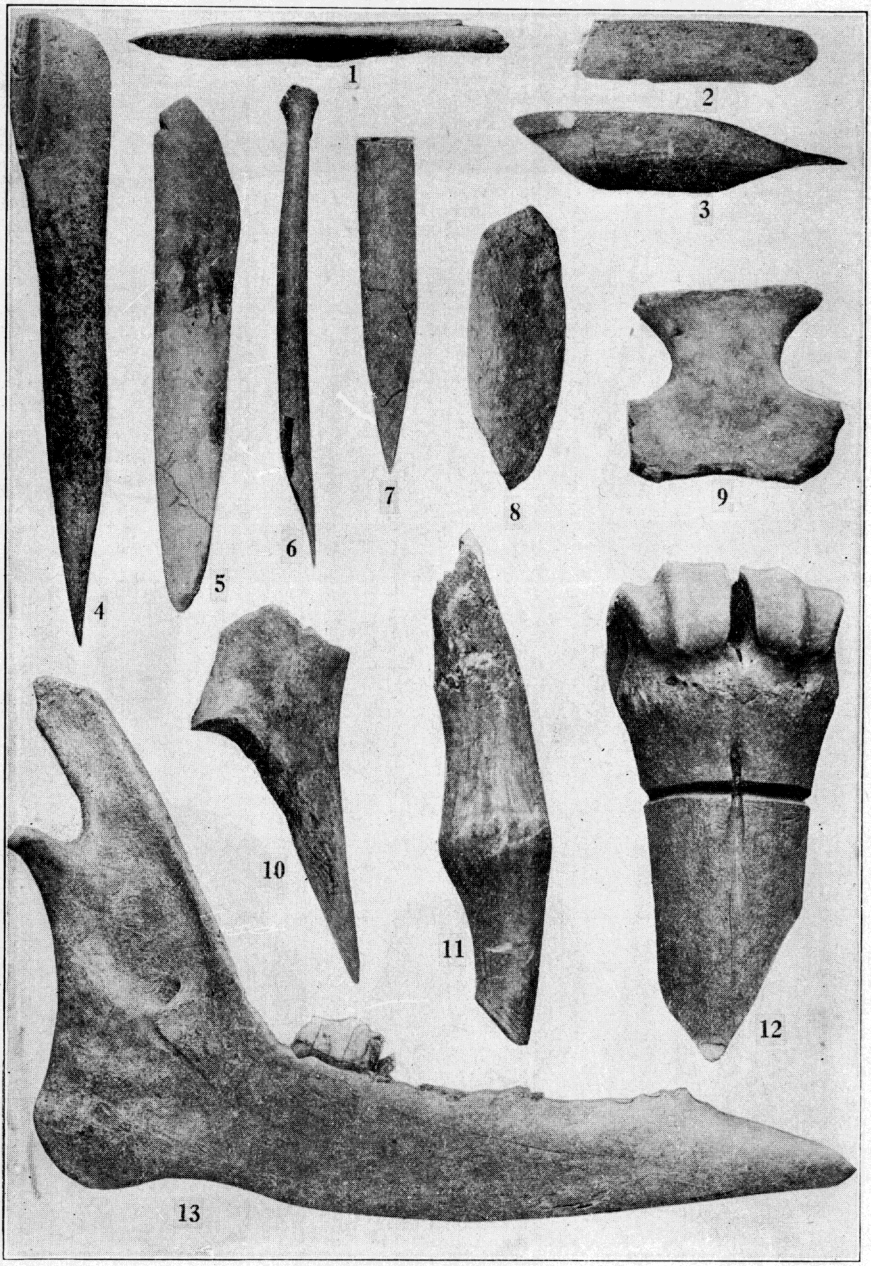


FIG. 1. Bone awls and needles. FIGS. 2-6. Mussel shells *(Lampsilis ventricosa)*. From the W. J. Seever collection. (¼ natural size.) FIG. 7. Hematite axe. FIG. 8. Grooved axe. From the Monticello Seminary collection. FIG. 9. Celt of porphyritic rock, from the Wells-Tippetts Village Site. (1/3 natural size.)



FIGS. 1, 2. Awl and celt made of deer bone. FIGS. 3-7. Bone awls. FIG. 8. Bone knife. FIG. 9. Part of breast bone of Virginia deer. FIG. 10. Awl made from heel of deer. FIG. 11. Pathologic leg bone of deer. FIG. 12. Foot bone of Wapiti with deeply incised lines. FIG. 13. Lower jaw of Virginia deer used as a chisel or gouge. (About 2/3 natural size.)