MAMMALIA

OF THE

BAUM PREHISTORIC VILLAGE SITE.

A THESIS

FOR THE DEGREE OF

MASTER OF SCIENCE

by

WILLIAM C. MILLS.
The Baum prehistoric village site is situated in Ross County, Ohio, just across the river from the small village of Bourneville, and is located upon the first gravel terrace in the valley of Paint Creek. The village site embraces a tract of land containing upward of ten acres. To one edge of this village site, and near the bank where once flowed Paint Creek, is a very large pyramidal mound. This mound was examined a number of years ago under the direction of the Smithsonian Institution at Washington. A complete report of these explorations is found in the Twelfth Annual Report of the Bureau of Ethnology, 1890 - 91. At that time the village site was not explored but it was known to exist; as the following extract from this report will show:

"This mound was situated upon the edge of the first general bottom of Paint Creek, which though protected by high levees, is annually inundated. In overflow time the smaller circle of the adjoining enclosure is almost entirely submerged and the summit of the mound is the only land visible above a broad expanse of water. Around the mound upon all sides, particularly to the east, are traces of former Indian occupation. Numerous fragments of pottery similar in texture, fabrication and ornamental feature to those
found in the mound, bestrew the plowed ground. These were intermingled with the valves of mussel shells, pitted stones, shell disks, human bones, arrowheads, perforated stone gorgets and a large quantity of chipped flint".

Thus it will be seen that the explorers while examining this mound, also made a casual examination of the material that was found upon the surface, showing that the pottery fragments, found upon the surface, were similar in every respect to the pottery found in the mound.

A great number of bone awls and arrowpoints made of bone, which were similar to those found in the mound, were exhumed from this village site during the summers of 1899 - 1900.

During the season of 1899, with five men, I worked upon this village site directly north and south of this mound, and during the season of 1900 I had from twelve to fourteen men at work and examined a large tract of land directly east of the mound.

The land upon which this village site is located is owned by Mr. J. E. Baum, after whom the village was named. He not only kindly granted us the privilege of working in this village, but in very
many ways aided us in the work. About three-fourths of a century ago, Mr. Smith's grandfather cleared this land, and it has been practically in cultivation ever since.

From twelve to thirty-six inches of leaf-mold and alluvial deposit, overlie the thin stratum of hard pan, directly beneath this hardpan is found gravel.

Less than two acres of this village site has been dug over inch by inch. Many objects have been discovered; some with the skeletons, which are usually found at a depth of from two to two and one-half feet. But the greater amount of material, especially the bones of the various animals used for food, were found in the ash pits.

These "ash pits" as they are well named, are circular excavations from three to four feet in diameter and from four to seven feet deep. Most of these pits have a greater diameter at the bottom, though a few have been found that have the same diameter from top to bottom. The object for which they were made, I think, was for the purpose of getting rid of the refuse of the village, for here are thrown animal bones, broken pottery, perfect and broken implements and ashes from their little homes. These pits are, in a number of cases, in close proximity to
each other. The average pit may be said to contain ashes in more or less definite layers. With these ashes, near the top, bones and pottery fragments can be found. After removing the contents of the upper third of the pit a stratum of fine white ashes is found, which in some cases is only a few inches in thickness, while in others it is more than two feet. Sometimes this mass of ashes will contain a thin stratum of sand or clay, and sometimes the bones of mammals and turtles will be completely mixed with the ashes. Very frequently below the mass of ashes will be found burned stones, and very frequently burned bones of various animals. Through the whole mass in these ash pits, from the top to the bottom, are found bones of fishes, mammals, reptiles and birds, also implements and ornaments of bone, stone and shell.

The bones of the larger species of mammals such as the elk, deer and bear are usually broken into small fragments. In one pit fifty-nine carapaces of the small land turtle were removed. A careful memoranda of all the bones taken from one pit was made. This pit measured three feet, seven inches in diameter, by five feet, ten inches in depth, and contained 375 bones.

Of these bones, 35% were of the Virginia deer, 10% of the wild turkey, 5% of the raccoon, 5% of
the black bear and 5% of the box turtle. The remainder of the bones in the pit were about equally divided between the ground hog, wildcat, opossum, beaver, rabbit, wild goose and great horned owl.

This pit may be taken as a representative of all the pits in this village site. However some are very much smaller while others are larger. If anything they would average smaller in size than the one I have kept the memoranda of.

All through this village site are found post molds which extend, in some cases, to the hardpan beneath. These were evidently the posts that made up the framework of the little homes. Inside of these post molds are usually found fire-places, and wherever these indications of a home are found, pits will invariably be found in close proximity. They are located around it indiscriminately, and in some cases three or four pits are located very near together, being only a few inches apart at the bottom.

The pits when they were first constructed may have been used for places of storage. In a number of instances we have found the bottom and
sides lined with broken pieces of pottery, charred straw, and in one a portion of a woven fabric was removed. The pits that were thus lined were, no doubt, first used as store houses for the grain and provisions and afterward abandoned and used for refuse pits. In two instances we exhumed skeletons of an adult; these were placed at the bottom of the pits. The body at the time of its interment was doubled up so as to conform to the size of the pit. Invariably there would be, directly over the skeleton, a layer of ashes ranging in thickness from sixteen to twenty inches, and this pit would be filled in the usual way, with refuse from the village.

In several pits large lumps of plastic clay were removed. This clay was covered with marks, which looked very much as if it had been packed in a basket of some sort, as it had the marks of the basket upon the outer edge of the lumps.

During the seasons work in this village fifteen barrels of animal bones were brought to the Museum for classification and comparison. With this great amount of material, if there was any difference between the mammalian fauna of prehistoric times and modern forms, it certainly would be found here. But all the specimens so
far compared show identity with modern forms which indicates that the mammalian fauna has remained practically unchanged since the time of these aboriginal inhabitants.

For notes regarding type locality, geographical distribution and general characteristics of the various mammals found in this village site, I am indebted to Prof. Daniel Gerard Elliot, as described by him in his admirable volume "A Synopsis of the Mammals of North America and the Adjacent Seas".

The following is a catalogue, with drawings and full description of all the mammalia so far found at the Baum prehistoric village site.

Drawings are natural size unless otherwise stated.
MARSUPIALIA

Family ...... Didelphidae.
Genus ...... Didelphys.
Species .... Didelphys virginianus.

The type locality of the opossum is Virginia.
The geographical distribution is from New York along
the Atlantic coast to Florida and west to Mississippi
and Texas.

The feet have five distinct toes, all
provided with nails except the first toe, which is
large, opposed to the others in grasping, and is without
a nail. The tail is long, prehensile, partly naked.
Pouch complete. Long bristle-like hairs mingled
with the fur. The under fur of the animal is white;
upper parts covered with black and white hairs, the
latter the longer and giving a hoary or whitish
appearance; the head is yellowish white, pure white
on cheeks, blackish on top of head and around the eyes;
beneath dusky with white hairs intermixed. Legs
and feet black; tail black at base; ears black with
yellow spot on upper edge.

The dental formula is as follows:

\[
\begin{align*}
\text{I} & \quad 5 - 5 \\
\text{C} & \quad 1 - 1 \\
\text{P} & \quad 3 - 3 \\
\text{M} & \quad 4 - 4 \\
\end{align*}
\]

\[= 50\]
Specimens in hand show that the incisors are small and very pointed. The canines are quite large and strong. The premolars have compressed pointed crowns. The first three molars of the upper jaw are very angular in form with flat crowns and small cusps upon the surface, while the fourth molar is not so angular and the crown is more flattened.

The remains of this animal are not found in great abundance in the ash pits. Fifteen portions of skulls were exhumed. The largest one is shown in the accompanying plates. But very few of the larger bones of the body were removed, but broken pieces of all the larger bones were taken from almost every pit. In only two instances were the femur and tibia of the opossum found in a perfect state.
PLATE I.

Didelphys virginianus.

Plate I shows drawing of an almost perfect skull. The posterior portion of the brain cavity has been destroyed. The lower mandible, which is also shown in this plate, is perfect with the exception of the incisor teeth and the upper portion of the coronoid process.
PLATE II.

Didelphys virginianus.

Plate II shows drawing of the anterior and posterior surface of a perfect scapula; also the anterior and posterior surface of the femur, of the opossum.
UNGULATA.
Family...... Cervidae.
Sub. family.. Cervinae.
Genus ...... Cervus.
Species...... Cervus canadensis.

The type locality of this animal is eastern Canada. The geographical distribution extends from northern Mexico, in the Rocky Mountain region, to British Columbia on the north, and from the eastern base of the Rocky Mountains to about the 120th meridian. It is practically extinct on the great plains but a specimen is now and then taken in northern Minnesota and northern Dakota.

The size is very large; antlers with often more than five tines, curving backward; flattened in the upper portion; fourth tine the longest; the bez and brow tines close together and of nearly equal length; crowns sometimes cup shaped; caudle disks enormous.

The following is the dental formula:

\[
\begin{align*}
I & - 0 - 0 \\
C & - I - I \\
P & - \frac{3 - 3}{3 - 3} \\
M & - \frac{3 - 3}{3 - 3} = 34
\end{align*}
\]

An examination of the teeth of the elk taken from this village site shows that the molars and premolars
of both the upper and lower jaws are made up of variously curved and folded ridges; the crown of the tooth is broad and the ridges are greatly developed. The interspaces between these ridges are filled with cement which supports and makes a compact solid mass of the whole tooth. When the surface of the tooth wears away by friction the different density of the layers that form the tooth are exposed to view; the hard enamel ridges that form the outside of the tooth usually project beyond the others and gives rise to a grinding surface of great mechanical advantage. Thus we have three elements making up the tooth of the elk, first the enamel, second the dentine, and third the cement. One feature of the teeth of the elk is that when they become old the ends of the roots of the molars and premolars become greatly enlarged. In the jaws exhumed none of the canine teeth were present although quite a number of these teeth were found perforated with a hole near the root and were no doubt used as ornaments.

Only small portions of parts of the jaws were found as the head was broken up to procure the food that the brain would afford. Only small portions of the
large bones of this animal could be procured
as these bones, no doubt, furnished aboriginal man
the material for making his implements and ornaments.
However each pit furnished a few bones of the elk.
PLATE III.

Cervus canadensis.

Plate III shows drawing of the largest portion of the jaw of this animal, found in the Baun village. However it shows the perfect dentition of the lower jaw. The teeth are much worn but in perfect condition.
PLATE IV.

Cervus canadensis.

Plate IV shows a portion of the upper jaw of this animal. This is the largest portion of the upper jaw, found in this village.
PLATE V.

Cervus canadensis.

Plate V shows a portion of the lower jaw, with the third molar tooth just coming through the jaw. The enameled portion of the tooth is shown in the drawing as completely formed while the root is just commencing to form. The third molar is the last tooth to come through the jaw.
PLATE VI.

Cervus canadensis.

Plate VI shows drawing of a new and old third molar. The oldest molar, as is readily seen, is greatly enlarged at the ends of the roots, while the new molar is free from such protuberances.
PLATE VII.

Cervus canadensis.

Plate VII shows drawing of the enlarged roots of the molars and premolars of an old animal.
UNGULATA.

Family....... Cervidae.
Sub. family.. Cervinae.
Genus....... Odocoileus.
Species....... Odocoileus virginianus.

The bones of the deer were found in great numbers in this village site.

The type locality is Virginia. Its geographical distribution is through eastern North America from Ontario, Canada and Maine to Florida, and west to the Missouri River, below the Canadian boundary line.

The general characteristic of this animal is that the antlers have a sub-basal snag, beyond which the beam is curved forward and soon after forks dichotomously, the lower fork again forking presenting a beam with three practically vertical tines rising above it.

The following is the dental formula:

\[
\begin{align*}
I_{4-4} & \quad C_{0-0} \\
& \quad P_{3-3} \\
& \quad M_{3-3} \quad = \quad 32
\end{align*}
\]

The remains of the deer taken from this village site show a structure of the teeth
in every way similar to that of the American elk, only the teeth are much smaller, but the general structure and type is the same. However the canine teeth which are present in the upper jaw of the elk are absent in that of the deer. Of the jaws examined the older animals do not show an enlargement at the ends of the roots of the molar and premolar teeth, which is so characteristic in the elk.

The various bones of the skeleton were very hard to procure in a perfect state, all of them having been crushed or broken in an attempt to remove the flesh from them. As has been shown in my general description of this village site, 35% of all the bones taken from the ash pits and refuse heaps belong to this deer.

Parts of 350 lower jaws have been exhumed from these ash pits. These would represent that many individual animals, as I have not been able in any case to match these lower jaws. Of this number only one jaw has been removed in perfect condition, the remainder having been broken either by the loss of the teeth or by the loss of some part of the jaw. Of the 350 jaws examined, 57 were from young deer that had not reached maturity, while 62 of the jaws represented old animals having their teeth very much worn. The remainder were in a perfect condition and showed that
the animal had reached maturity.

Fifty skulls of this animal were procured from the refuse pits, and only two or 4% of the fifty were females and the remainder, 48 or 96% were males. Of this 96%, 74% were killed during the fall and winter seasons, while 22% were killed shortly after the animals had shed their horns. The small per cent of female skulls shows that aboriginal man made a selection in the killing of animals and the large percent of animals killed in winter shows that they depended largely on animal food during the winter, and that when corn, beans, and seeds of various kinds were in season they did not depend so much on the killing of animals for their food.

125 shoulder blades of this animal were found in a perfect condition. These bones were used for making awls, but as they procured a great many of these animals they could not utilize all of the bones.

Parts of ten femurs were all that could be procured of this bone. They were no doubt broken up to extract the marrow and the small pieces and splinters of bones worked up into awls and needles.
The following is a list of the other bones of the deer procured from this village site.

- ulnas: 41
- tibias: 10
- ends of metacarpal bones: 210
- perfect metacarpal bones made into scrapers: 20
- ends of metatarsal bones: 105
- perfect metatarsal bones made into scrapers: 9
- innominati: 21
- ribs: 75
- vertebrae (axes and atlas only): 90
- bones of the foot: 175
PLATE VIII.

Odocoileus virginianus.

Plate VIII shows drawing of the skull of an adult male, the beam having been broken off just above the first tine; this is the general condition of all the skulls found in this village site. The lower part of the skull is entirely broken away so that the brain cavity is exposed.
PLATE IX.

Odocoileus virginianus.

Plate IX shows drawing of the skull of an adult deer, which had been killed after the shedding of its horns.
PLATE X.

Odocoileus virginianus.

Plate X shows drawing of a perfect half of the lower jaw. This is the only perfect specimen of the lower jaw found in the 350 removed from the pits.
PLATE XI.

Odocoileus virginianus.

Plate XI shows drawing of an adult specimen with the bone removed to show the manner in which the teeth are inserted in the jaw.
PLATE XII.
Odocoileus virginianus.
Plate XII shows drawing of the only perfect upper jaw removed from the ash pits.
PLATE XIII.
Odocoileus virginianus.
Plate XIII shows drawing of the teeth of the lower jaw of an adult deer.
PLATE XIV.

Odocoileus virginianus.

Plate XIV shows the dentition of the upper jaw of an adult deer.
RODENTIA.

Family....... Sciuridae.
Sub. family.. Sciurinae.
Genus....... Arctomys.
Species....... Arctomys monax.

The type locality of the ground hog is in Maryland. Its geographical distribution extends from New York to Georgia, west to the Dakotas, intergrading in the Alleghanian and Canadian faunae.

The body is robust, heavy; ears, large and rounded; tail bushy and less than one-half the length of the body.

The color varies from almost black to yellowish or whitish gray; the crown and upper parts usually brownish black; the nose and chin gray; cheeks and throat yellowish white; under part brownish chestnut; the feet black or dark brown, tail black.

The dental formula is as follows:

\[ I \frac{1}{1} - \frac{1}{1} \quad P \frac{2}{1} - \frac{2}{1} \quad M \frac{3}{3} - \frac{3}{3} = 22 \]

A number of broken skulls were found in the ash pits and a comparison of these skulls shows that the incisors of the upper jaw are very much
stronger than those of the lower jaw. The two premolars of the upper jaw differ very much from each other; the first tooth has a cone shaped crown which is circular in form and has a single root, while the second premolar has three roots and the crown is covered with small ridges. The single premolar of the lower jaw is very similar to the second premolar of the upper jaw, but differs in this, that it has small cone shaped cusps upon the anterior part of the tooth, while the posterior portion is flat with the small cusp developed upon the outside of the tooth. The molars of both the upper and lower jaws are very similar. Those in the upper jaw have three roots, while those in the lower have four. In the upper jaw the teeth slant to the outside and are higher on the inside, while the teeth in the lower jaw slant to the inside and the outside of the tooth is higher than the inside.

The remains of the ground hog were very abundant. In almost every pit, bones of this animal were found, very nearly all of which were broken. Only one perfect skull was exhumed from the ash pits. Only a very limited number of the larger bones were found but great quantities of the broken ends of femurs, humeri and vertebrae were taken from every section of this village site.
PLATE XV.

Arctomys monax.

Plate XV shows drawing of both the upper and lower sides of the skull of the ground hog.
PLATE XVI.

Arctomys monax.

Plate XVI shows drawing of the skull and lower mandible of the ground hog.
PLATE XVII.

Arctomys monax.

Plate XVII shows drawing of the dorsal and ventral views of the femur of the ground hog; also the dorsal view of the humerus.
RODENTIA.

Family......... Castoridae.
Genus......... Castor.
Species......... Castor canadensis.

The type locality of this animal is Hudson Bay. Its geographical distribution extends from northeastern North America, from the northern tree limit of the United States and west to the Cascade mountains.

The skull is massive, no postorbital processes, the superior outline nearly straight; molars single rooted with re-entering of enamel fold and decrease in size posteriorly. The molar series is not parallel but converges anteriorly to the palate. The lower jaw is massive. The incisors are large and powerful, the lower jaw longer than the upper, with chisel like edges and of a deep orange red color, exteriorly.

The dental formula is as follows:

\[
I_1 \cdot I_1 - I_1 \quad P_1 \cdot I_1 - I_1 \quad M_3 - 3 \quad = 20
\]

The beaver is well represented among the animals found in this village site. However but very small portions of the skull were found and these show that the molars and premolars both in the upper and lower
jaws are made up of a number of layers of enamel and
dentine, the dentine wearing away faster than the
enamel and leaving a grinding surface of great
advantage to the animal.

Twenty portions of the skull of the beaver
were taken from the pits. The largest pieces found
are shown in the accompanying plates. The incisor
teeth were greatly sought for by aboriginal man; these
were cut and used for ornaments, they were also used for
cutting tools. The molars and premolars of both the
upper and lower jaws were of but little use, but in
removing the incisors the skull was broken up, and the
teeth and broken portions can be found in almost every
pit. The larger bones, especially of the legs were
in a better state of preservation than those of any other of
the animals.
PLATE XVIII.

Castor canadensis.

Plate XVIII shows drawing of the largest portion of both the upper and lower jaw of the beaver, taken from this village site.
PLATE XIX.

Castor canadensis.

Plate XIX shows drawing of the anterior view of a perfect femur and humerus of the beaver.
RODENTIA.

Family...... Muridae.
Sub. family.. Microtinae.
Genus....... Fiber.
Species..... Fiber zibethicus.

The type locality of this animal is eastern Canada. The geographical distribution extends from Labrador to the Gulf States (and possibly to the Dismal Swamp, Virginia) and from the Atlantic to the Pacific, north to the Gulf States and Arizona.

The animal is of a large size; the tail about equal to the body without the head. The color is dark, ranging from a very dark brown, nearly black to pale brown. The sides of the head are a bright chestnut brown, the under fur a bluish gray. The feet are dark brown; the tail black.

The dental formula is as follows:

\[
\begin{array}{c}
I - 1 \\ I - 1 \\
M - 3 - 3 \\
I - I \\
3 - 3
\end{array}
= 16
\]

The skulls and teeth of the musk rat were obtained in this village site in limited quantities, but those that were taken show incisors of the upper jaw quite strong and circular in form, while
those in the lower jaw are very much smaller and not so curved. The three molars of both the upper and lower jaws are similar in size and shape. The crown of the tooth is made up of an enamel portion filled with dentine; the enamel portion represents a zigzag like line and the teeth are set very close together so that it is almost impossible to tell but what the teeth in the jaw represent one continuous tooth instead of three.

Only one perfect skull was found, although a number of the leg bones were found in a perfect state, yet quite a number were broken in very small pieces. The bones of this animal do not appear in all of the pits and one would infer that they were not so plentiful as the ground hog and beaver. Perhaps this may be due to the smallness of the animal and the bones being broken.
PLATE XX.

Fiber zibethicus.

Plate XX shows drawing of upper and under views of a perfect skull of the muskrat; also a perfect lower jaw.
PLATE XXI.

Fiber zibethicus.

Plate XXI shows drawing of a perfect humerus and femur and combined tibia and fibula of the muskrat.
RODENTIA.

Family....... Leporidae.
Genus....... Lepus.
Species....... Lepus sylvaticus.

The type locality of the rabbit is unknown.
The geographical distribution extends from southern Maine along the coast to Florida and the Gulf States, west to eastern Kansas, Nebraska and the Indian Territory. In the states bordering on the Mississippi it grades into the variety nuttali and in Arizona into the variety arizonae. In the interior its range is limited apparently by the northern boundary of the United States.

The general characteristic of the rabbit is that the hind feet and the ears are longer than the head.

The color is of a pale yellowish brown varied with black, the sides and rump grayer, nape and limbs yellow rusty fading into whitish on the interior surface of the hind legs; the head above less varied with black than the back; beneath white, except the breast, which is pale yellowish brown. The hairs of the upper surface have long shining black tips succeeded by a broad bar of pale yellowish brown, then a narrow zone of black; the under fur black plumbeous, often tipped with pale brown.
The dental formula is as follows:

\[ \frac{I_2}{I_1} - \frac{P_3}{2} - \frac{M_3}{3} = 28 \]

The specimens taken from Baum village site show upper incisors quite different in size, the largest being on the outside and the smallest on the inside. The lower incisors are invariably quite sharp and differ very much as to curve, from the upper incisors. The three premolars of the upper jaw are very much alike, the first being smaller and set at a different angle from the others in the jaw. The two premolars of the lower jaw are very similar to the three premolars of the upper jaw. The three molars of the lower jaw are also similar to those of the upper jaw. Both the molars and premolars of the upper and lower jaw have deep indentations, each side of the tooth extending from the crown to the end of the root. In the upper jaw the outside of the tooth is very much higher than the inside, while on the lower jaw the inside of the tooth is very much higher than the outside.

Great quantities of the broken bones of the rabbit are found in each pit. Only two skulls were taken out in a perfect state; these are shown in the drawings.
PLATE XXII.

Lepus sylvaticus.

Plate XXII shows the under side of the skull and lower mandible of one animal, and also the lower mandible and upper side of another animal, taken from one ash pit.
CARNIVORA.

Family....... Felidae.
Genus....... Felis.
Species....... Felis concolor.

The geographical distribution of the mountain lion extends from about 50° north in Canada to the Gulf of Mexico and westward to Wyoming and probably extends to the Pacific coast.

The animal is of a large size; body long; the legs short; tail more than one-half the length of the body and head; when young the animal is spotted.

The color is variable; the upper parts vary from a yellowish to a reddish brown; beneath a dirty white; on the upper lip there is a black patch bordered by a white space; the back of the ear is black; the tip of the tail is dusky.

The following is the dental formula:

\[
\begin{array}{cccc}
I & 3 & - & 3 \\
3 & - & 3 \\
C & I & - & I \\
I & - & I \\
& P & 3 & - & 3 \\
& 2 & - & 2 \\
& M & I & - & I \\
& I & - & I \\
\end{array}
\]

= 30

The remains of the mountain lion taken from the ash pits show that the cat family has fewer teeth than any other family of carnivora. The canines are quite large, strong, long, curved and acute; edges trenchent. In both the upper and lower jaw there is
one true molar on each side and two inferior premolars. The posterior premolar is very large with a tri-lobed blade and a small inner tubercle with a separate root. The lower molar is quite large being a compressed sharp blade with two sub-equal lobes without inner cusps.

The skull is short, quite broad; the facial portion especially short; the zygoma is arched and very wide; the bulla is smooth and quite large.

The bones of this animal are not found in abundance in this village site. Those found are invariably broken either to procure the teeth or for the extraction of the brain. Very nearly all of the canine teeth are used for ornaments; the posterior premolar and the lower molar are also used as ornaments. Invariably the roots of these teeth are perforated for attachment.
PLATE XXIII.

Felis concolor.

Plate XXIII shows drawing of the most perfect lower jaw of the mountain lion found in this village.
PLATE XXIV.

Felis concolor.

Plate XXIV shows drawing of fragment of the upper jaw of this animal.
PLATE XXV.

Felis concolor.

Plate XXV shows drawing of a perfect tibia of this animal.
PLATE XXVI.

Felis concolor.

Plate XXVI shows drawing of a perfect humerus of this animal.
PLATE XXVII.

Felis concolor.

Plate XXVII shows drawing of a perfect ulna of the mountain lion.
CARNIVORA.

Family........ Felidae.
Genus......... Felis.
Sub. genus... Lynx.
Species....... Lynx rufa.

The type locality of the wild cat is New York. The geographical distribution is central North America from Georgia to Maine.

The general characteristics are a moderately stout body; long legs; short tail.

The fur is very soft and full and is of a yellowish brown color, spotted on the sides with a darker brown; the forehead is striped with brown; there is also a brown stripe on the back and tail; the under parts are yellow and white spotted with black; the legs are a yellowish brown spotted with black on the outside; white on inner barred with black; two black bars extend across the cheeks.

The dental formula is as follows:

\[
\begin{array}{ccccc}
I & 3-3 & C & I-I & P & 5-3 & M & I-I \\
3-3 & I-I & 2-2 & I-I & = 30
\end{array}
\]

The dental formula, as well as the general make up of the teeth are exactly the same as felis concolor, the only difference being in the size of the
teeth.

This animal is found in great abundance in the ash pits; yet but few perfect bones were found. However great quantities of portions of the upper and lower jaws were found in almost every pit. 125 lower jaws were exhumed during the season of 1900. The canine teeth especially were highly prized as ornaments and but few of the jaws procured, contained this tooth.
PLATE XXVIII.

Lynx Rufa.

Plate XXVIII shows drawing of both the upper and lower jaw of the wild cat.
PLATE XXIX.

Lynx Rufa.

Plate XXIX shows drawing of a perfect shoulder blade of the wild cat.
PLATE XXX,

Lynx Rufa.

Plate XXX shows drawing of a perfect femur and a perfect humerus of the wild cat.
CARNIVORA.
Family........ Canidae.
Sub. family... Caninae.
Genus......... Canis.
Species....... Canis occidentalis.

The type locality of this animal is not definitely known but it is supposed to be the plains of Saskatchewan.

The geographical distribution is western North America to Nebraska and Idaho, south into Mexico and north into Greenland. However it is quite rare east of the Mississippi River.

The wolf is very large; of a light grizzled gray in color. However the color of the species vary from all white through different degrees of gray to black, but the majority of them are gray and white tinged with brown.

The wolf has a long tapering nose with elongated jaws; the postorbital processes of the frontals are short, the orbit open posteriorly; the brain case is greatly lengthened and compressed anteriorly; the claws are short, and blunt, but curved.

The dental formula is as follows:

\[
\begin{array}{cccc}
I & 3 & 3 \\
\frac{3}{3} & 3 \\
C & I & I \\
\frac{1}{1} & 1 \\
P & 4 & 4 \\
\frac{4}{4} & 4 \\
M & 2 & 2 \\
\frac{2}{3} & \frac{2}{3} \\
\end{array}
\]

\[= 42\]
The remains of the wolf exhumed from this village site show that the upper posterior premolar is very large, having a strong blade, the middle lobe being conical and pointed backward; the anterior lobe nearly obsolete. The anterior molar of the lower jaw has a large blade, the hinder lobe is compressed, the central lobe being the largest.

The bones of the wolf are not found in abundance in the ash pits. When they are found they are usually broken. Only one perfect upper jaw with the brain case lacking was found in this village site.

The teeth especially the canines and the posterior premolars were used for ornaments. A number of the lower jaws were cut so as to retain the teeth, and these were also used as ornaments. Not a single perfect lower jaw was found in the entire village; the nearest approach to one is found in the accompanying plate.
PLATE XXXI.

Canis occidentalis.

Plate XXXI shows drawing of the anterior part of the skull of this animal, showing the teeth and the posterior part the brain having been destroyed.
PLATE XXXII.

Canis occidentalis.

Plate XXXII shows only a part of the lower jaw, the anterior part of which had no doubt been cut off and used for making ornaments.
CARNIVORA.

Family........ Canidae.

Genus......... Urocyon.

Species....... Urocyon virginianus.

The type locality of this animal is not known, but it is located somewhere in North America.

The geographical distribution is eastern North America from Georgia north to New England, and west to the Mississippi.

The size is large; the tail is more than one half the length of the head and body.

The entire upper parts are of a silver gray extending over the outer side of the four legs; base of ears, patch at side of neck, collar on the throat, the interior surface of the four legs and a broad band along the under parts, are all cinnamon rufous; the upper parts inside the thighs are of a grayish white; the chin and patch on the nose near the muzzle, black; the tail and breast are of a silver gray, the central portion and the tip are black while beneath it is of a light chestnut.

The dental formula is as follows:

\[
\frac{I-3 - 3}{3 - 3} \quad \frac{C-I - I}{I - I} \quad \frac{P-4 - 4}{4 - 4} \quad \frac{M-2 - 2}{3 - 3} = 42
\]

The greatest number of bones of this animal
especially of the lower jaw, taken from this village site show that one feature of the teeth of this animal is that the premolars both in the upper and lower jaws are separated from each other by from one-sixteenth to one-eighth of an inch, while the molars are very close together both in the lower and upper jaws. The first three premolars of the upper jaw have a cone shaped crown with sharp cutting edges, while the fourth premolar is very much larger, having three roots; from the crown of this tooth arises two cusps, chisel shape in form, while on the inner side to the front of the tooth one small cone shaped cusp arises, making the tooth very complex. The molars are set at right angles to the premolars in the upper jaw and these are characterized by having on the outer surface of the crown two cone shaped cusps. The inside of the tooth is very much flattened with small elevations. The first premolar of the lower jaw has one root and terminates in a cone shaped crown. The other three premolars are small, having two roots, the crown terminating in a sharp cone shaped cusp. The anterior molar is quite large, much larger than the other two molars combined; the anterior portion of the tooth is made up of two chisel shaped cusps, while the back of the tooth is flat with small elevations upon the crown. The second molar is very flat, the
crown having but few elevations, the largest being on the inside. The posterior molar is quite small having a flat crown with small elevations upon the surface.

The bones of the gray fox are found in all parts of this village site. The lower jaws especially are found in great numbers in almost every pit. 135 parts of lower jaws were exhumed during the season of 1900. The incisor teeth seem to be the only ones sought for and were no doubt used as ornaments. The smaller bones were also used for making their implements and ornaments.
PLATE XXXIII.

Urocyon virginianus.

Plate XXXIII shows drawing of the posterior portion of the skull of the gray fox. This is the largest portion of a skull of this animal, found in the village site.
PLATE XXXIV.

Urocyon virginianus.

Plate XXXIV shows drawing of both the upper and lower jaw. The incisor teeth as well as the canines are absent.
PLATE XXXV.

Urocyon virginianus.

Plate XXXV shows drawing of femur and humerus. These two specimens represent the only perfect bones of this animal found in the village site.
CARNIVORA.

Family........ Canidae.
Genus........ Canis.
Species........ Canis---- (Indian dog).

The Indian dog is found in great numbers in this village site. Specimens were sent to Prof. F. A. Lucas of the United States National Museum at Washington for identification. Prof. Lucas gives the following description of this dog, "The breed represented is a short faced one, much the size and proportions of the bull terrier, though probably not short haired. It seems to have been a favorite breed in many parts of the west and south, and I have seen specimens, apparently of the same breed from the old village sites in Texas and from the old pueblos.

The dental formula is as follows:

\[
I^3 \quad C^1 \quad P^4 \quad M^2 \quad = 42
\]

The canine teeth of the lower jaw are quite large and strong, the inner edge of each being quite sharp. The first molar is quite large with chisel shaped cones upon the surface of the anterior part of the tooth, while the posterior part is very large and flattened, but has a number of small cusps arising from
the edge of the tooth; this molar is very much larger than the second and third combined. In the upper jaw the first, second and third premolars are very much alike, although the first is single rooted and not so large. The fourth premolar is very large with cone shaped cusps arising from the crown, the inner part chisel shaped in form. The two molars are very different although in general character alike. The first is very much larger than the second and the teeth are set at right angles to the premolars. The outside of the anterior molar is made up of two large cone shaped cusps, while the inside of the tooth is very large and flattened and the crown low. The second molar has two cone shaped cusps upon the outside of the tooth and is quite flattened and very much smaller than the first molar.

The Indian dog was no doubt the only domestic animal possessed by these aboriginal people. More than fifty broken skulls and lower jaws were taken from the ash pits, and a number of bones showing that they were used for making their implements and ornaments. There is no doubt but what the dog was a domestic animal and lived in the village, as a number of bones that were taken from the pits show that they had been gnawed, and this led me to believe, even before I found its remains, that the dog would be found here. This dog was also used for food as bones were found, broken similar to those of the other animals.
PLATE XXXVI.

Canis.... Indian dog.

Plate XXXVI shows drawing of an almost perfect skull of the Indian dog.
PLATE XXXVII.

Canis..... Indian dog.

Plate XXXVII shows drawing of posterior under portion of the skull of the Indian dog.
PLATE XXXVIII.

Canis...... Indian dog.

Plate XXXVIII shows drawing of anterior under portion of skull, showing the dentition of the Indian dog.
PLATE XXXIX.

Canis.... Indian dog.

Plate XXXIX shows drawing of the lower jaw of the Indian dog; most of the teeth are shown.
PLATE XL.
Canis... Indian dog.

Plate XL shows drawing of an imperfect femur and a perfect humerus, of the Indian dog.
PLATE XL I.

Canis .... Indian dog.

Plate XLI shows drawing of deer bones that had been gnawed by the Indian dog. This led to the finding of the old Indian dog in the village site.
CARNIVORA.

Family...... Ursidae.
Sub. family.. Ursinae.
Genus....... Ursus.
Species...... Ursus (euarctus) americanus.

The type locality of this animal is considered to be eastern North America. The geographical distribution in North America seems to be where forests exist, except perhaps in Louisiana and Florida.

The animal is of moderate size; the nails are very short; the frontals usually elevated; the zygomata width considerable; teeth rather small.

The color of this animal is black, with the exception of a portion around the nose which is a tan color.

The dental formula is as follows:

\[ I^{3-3}_3 \quad C^{1-1}_1 \quad P^{4-4}_4 \quad M^{2-2}_3 \quad = 42 \]

The great number of upper and lower jaws found in this village site show molars with a broad and flattened surface. Those of the lower jaw are very much cup shaped while the second molar of the upper jaw is only slightly cupped with two sharp cutting apexes on one edge; the first molar of the upper
jaw is not flattened and the tooth is made up of two cones with pointed apexes and sharp cutting edges. The canines of the upper and lower jaws differ materially in their root; in the lower jaw the root is very broad and continues its width through its length almost to the end of the root. In the upper canine the root is quite broad near the top but tapers gently to almost a point at the end of the root. The premolars in both the upper and lower jaws are quite small and closely resemble each other.

No perfect large bones of the black bear were found in any of the ash pits, although twenty-three broken skulls were removed and in every instance the skull was broken to extract the brain. All the larger bones were broken up to extract the marrow so that only the ends could be procured. 70 parts of lower jaws were exhumed but none of these jaws were in a perfect condition. If the canine teeth were very much worn they were always found in place in the jaw, if from a young animal the teeth were invariably extracted, and to do this the jaws were broken to pieces.

The canines were the only teeth of the bear that were perforated and used for ornaments, although in several instances the lower jaw was cut so as to retain all the teeth and these were no doubt used as ornaments. The claws also furnished aboriginal man material for ornaments as a great many claws were found perforated for attachment.
PLATE XLII.

Ursus americanus.

Plate XLII shows the largest portion of a perfect skull of the bear, found in this village site.

Drawing reduced one half.
PLATE XLIII.

Ursus americanus.

Plate XLIII shows drawing of the largest portion of the upper jaw found in the village. The teeth are all present with the exception of the incisors.
PLATE XLIV.

Ursus americanus.

Plate XLIV shows drawing of an almost perfect lower jaw of this animal.
PLATE XLV.

Ursus americanus.

Plate XLV shows drawing of the dentition of this animal.
PLATE XLVI

Ursus americanus.

Plate XLVI shows drawing of both the upper and lower jaw. The tooth near the top of the page being found in the lower jaw.
CARNIVORA.

Family....... Procyonidae.
sub. family.. Procyoninae.
Genus....... Procyon.
Species....... Procyon lotor.

The body of the raccoon is quite stout; the tail is moderately long, semi bushy, annulated; ears short, hairy; soles naked; muzzles acuminate.

The type locality of the raccoon is not definitely known but is supposed to be in the Atlantic States. The geographical distribution is from eastern North America from Canada to western Georgia, and west to the Rocky Mountains north of Texas.

The general characteristic of the raccoon is that the feet are plantigrade, the hind feet not exceeding four inches.

The color is of a grayish white, tips of long hairs black; a black patch on the cheek, a paler one beneath the jaw and one behind the ear; the muzzle is black, the cheek patch white; tail is bluish with black and white rings.

The dental formula is as follows:

\[
I \frac{3-3}{3-3} \quad C \frac{I-I}{I-I} \quad P \frac{4-4}{4-4} \quad M \frac{2-2}{2-2} = 40
\]
The great number of both the upper and lower jaws found, show that this family of carnivora is very abundant in the village site. The incisors are short and stout, while the canines are very much curved and the edges trenchant. The first three molars of the upper jaw are characterized by round cone shaped cusps, while the fourth premolar has a large complex crown, having developed upon the surface a number of tubercles or cusps. The second molars of the upper jaw are quite large having a number of cusps developed upon the crown. The first three premolars of the lower jaw resemble very much those of the upper jaw. The fourth premolar of the upper jaw differs very much from the fourth premolar of the lower jaw in that it is not so complex, the elevations and cusps are similar to those on the other three premolars. The first molar of the lower jaw is larger than the second and has developed upon the crown a number of cusps.

The bones of the raccoon were found in every pit exhumed. However, but small portions of the skull were left intact, as they were broken up to extract the brain. The upper canines were much sought for and were used as ornaments. The leg bones were cut into beads and the fibulas were made into
awls. 227 lower jaws were removed from the ash pits during the season of 1900. However but very few perfect bones of the raccoon were found but the broken bones were in evidence in almost every pit.
PLATE XLVII.

Procyon lotor.

Plate XLVII shows drawing of the anterior portion of the skull showing the dentition, also drawing showing the upper aspect of the skull of this animal. The zygomatica width is unusually large.
PLATE XLVIII.

Procyon lotor.

Plate XLVIII shows drawing of the lower jaw of this animal.
PLATE XLIX.

Procyon lotor.

Plate XLIX shows drawing of the shoulder blade and innominate of this animal.
PLATE L.

Procyon lotor.

Plate L shows drawing of a perfect femur, ulna and fibula of this animal.
PLATE LI

Procyon lotor.

Plate LI shows drawing of a perfect ulna and humerus.
CARNIVORA.

Family....... Mustilidae.
Sub. family...Melinae.
Genus....... Mephitis.
Species....... Mephitis mephitica.

The type locality of this animal is unknown. The geographical distribution is from Nova Scotia, Quebec, Ontario, south and west to Virginia and Indiana.

The general characteristics are, size large; tail long, penicillated, bushy; head small; nose pointed; limbs moderate; subplantigrade.

The color is black; narrow frontal line; triangular nuchal patch; a line on both sides of back to tail; end of tail white. The markings vary considerably among individuals.

The dental formula is as follows:

\[
\begin{array}{cccccc}
I & 3 & - & 3 & C & I - I \\
3 & - & 3 & I & - & I \\
3 & - & 3 & P & 3 & - 3 \\
M & I & - & I \\
& 3 & - & 3 & 2 & - 2 \\
\end{array}
\]

But few skulls of the skunk were found in this village site, but an examination of these shows that the incisor and canine teeth resemble those of the otter. The upper teeth are large, straight and long while the lower teeth are small and very much curved.
The first two premolars of the upper jaw are very much alike both having a cone shaped cusp with sharp cutting edges. The third premolar is very much enlarged but is not so complex as the corresponding tooth of the otter; it has developed upon the surface a cone shaped cusp almost chisel shape in form. The single molar above is quite large, with concave center, developed elevations near the outer edge of the lower jaw. The three premolars are very much alike having sharp cone shaped cusps with cutting edges. The first molar is very large equaling in size the other molar and the three upper molars combined; it has a complex crown and upon the surface a number of cusps are developed. The second molar is quite small compared with the first; it is almost round, the crown having a flat concave surface.

This animal has been found in a number of the ash pits and is perhaps as plentiful as any other member of this family. However but two skulls in a perfect state were removed. Sixteen parts of both the upper and lower jaws have been exhumed during the entire excavations.
PLATE LII.

Mephitis mephitica.

Plate LII shows upper and lower views of a perfect skull of the skunk; also an inside and outside view of a mandible.
CARNIVORA.

Family.... Mustelidae.
Sub. family... Mustelinae.
Genus....... Putorius.
Sub. genus... Lutreola.
Species...... Putorius (lutreola) vison.

The type locality of this animal is Canada.
The geographical distribution is eastern North America
through Canada to Ontario and the Arctic Sea, westward
north of the Gulf States to the eastern boundary of the
Pacific coast.

The general characteristic of this animal is
that the tail is about one-half as long as the body
and nearly black. The ears are small.

The color is of a uniform chestnut brown, with
a white spot on the chin and sometimes on the chest
and abdomen. The tail is always darker than the body
and is very nearly black.

The dental formula is as follows:

\[
\begin{align*}
I & \quad 3-3 \\
3 & \quad 3-3 \\
C & \quad I-I \\
I & \quad I \\
P & \quad 3-3 \\
3 & \quad 3 \\
M & \quad I-I \\
2 & \quad 2 \\
\end{align*}
\]

= 34

The specimens in hand from the Baum village
site show incisors very small in both the
upper and lower jaws. The canines in the upper jaw are large and straight while those in the lower jaw are curved very similar to the other animals of this group. The first two premolars of the upper jaw are very much alike in shape, but very different as to size, the second being almost the size of the first, while the third differs greatly from the other two, the crown being very complex, having in the center a large cone shaped tubercle with two small tubercles on the outside and one on the inside of the tooth. The single molar of the upper jaw has also a very complex crown being concave in the center with both edges having small cusps upon the surface. In the lower jaw the three premolars are very much alike in form, differing slightly in size. The first molar is very large having a complex crown chisel shaped in the anterior part of the tooth and depressed in the posterior part. The second molar of the lower jaw is quite small with almost round crown and being very flat.

Only three perfect skulls of the mink were taken from the pits but upward of twenty lower jaws were found. The smaller bones of the skeleton were almost entirely absent and only a few of the ends of the bones were found.
PLATE LIII.

Putorius (lutreola) vison.

Plate LIll shows drawing of upper and lower views of the skull of the mink.
CARNIVORA.

Family....... Mustelidae.
Sub. family.. Lutrinae.
Genus........ Lutra.
Species...... Lutra canadensis.

The type locality of this animal is unknown.
The geographical distribution is eastern North America,
north of North Carolina on the Atlantic coast.
The general characteristics of this animal are
large size and the under portion of the feet hairy.
The color of the animal is a dark liver brown
above, paler on the under parts, and the under fur lighter;
the cheeks, lips, chin and throat whitish brown.
The dental formula is as follows:

\[
\begin{array}{c}
I_3^-3^+3 \\
C_1^-I^+1 \\
P_4^-4^+3^-3 \\
M_2^-I^-I^+2^-2
\end{array} = 36
\]

Parts of lower jaws and skulls taken from
this village site show incisors in the upper and lower
jaws very similar. However the canines of the upper
jaw are longer and stronger than those in the lower
jaw, which are very much curved and short. The
first premolar of the upper jaw is very small and grows
very closely to the canine on the inside and out of the
line of the other premolars. The second and third premolars are very much alike, having a sharp cone-shaped cusp, while the fourth premolar is very complex, the inside of the crown is flattened having two indentations. Near the outside of the tooth are two elevations one much higher than the other. The single molar of the upper jaw is very much flattened in the center of the crown, but on the inside and outside of the tooth cusps are developed which have very sharp cutting edges. The anterior molar of the lower jaw is very large, the crown on the posterior part of the tooth is very much depressed, while the anterior part of the tooth is quite complex having developed upon the crown three tubercules with very sharp cutting edges. The posterior molar is quite small as compared with the anterior; the crown is very much flattened being concave.

The bones of the otter are found in great numbers in the ash pits. However none of them are in a perfect condition, all having been broken for use in making implements and ornaments. The skulls have all been broken as is shown in the drawing.
PLATE LIV.

Lutra canadensis.

Plate LIV shows upper and lower views of the skull of the otter.
PLATE LV.
Lutra canadensis.

Plate LV shows drawing of a perfect lower jaw of the otter.