XIX. A FOSSIL-BEARING ALLUVIAL DEPOSIT IN SALTVILLE VALLEY, VIRGINIA.

By O. A. Peterson.

(Plate XLVIII.)

In the month of June, 1917, there was brought to the Carnegie Museum for identification a small collection of fossils from Saltville, Smyth County, Virginia. This material suggested a preliminary investigation of the locality, whence it came. The writer was therefore sent to the spot to examine the deposit. By the kind permission of Mr. W. D. Mount, the General Manager of the Mathieson Alkali Works, on the property of which the deposit is located, I was able to commence an investigation on June 23.

Saltville Valley is drained by a tributary of the North Holston River, and lies between a series of high and rounded hills in the early Paleozoic. (See Plate XLVIII.) A great deal of the valley was formerly covered by water during certain portions of the year, but is now drained by a series of canals and ditches. The approximate width of the valley is from one and one-quarter to one and one-half miles at its widest part. The surface is covered by rich black alluvium and clay which rests on a yellowish brown layer of clay heavily charged with gypsum.

![Diagram showing deposits at point where the bones were discovered.](image)

This stratum of yellow clay is probably of Pleistocene origin. Its thickness has not been accurately determined. Water is struck everywhere in the valley at a depth of about eight feet below the surface, and this may account for the fact that the depth of the formation alluded to is not more certainly known. In the deeper strata, to a depth of about one thousand feet, are various layers of salt, which are

being worked by wells sunk by the Mathieson Alkali Company. Their works are located on the Holston River approximately three-quarters of a mile from the wells. After these wells have been pumped for a longer or shorter time, there generally occur in close proximity to the well one or more sink-holes, the surface caving in, and causing much inconvenience to the company. At “Well No. 69” a cave-in recently occurred, and along its banks, some five or six feet below the surface, a number of bones of *Mastodon* were found by different parties in the employment of the company. A few of these, as has already been stated, found their way to the Carnegie Museum.

Some of these fossil bones are much worn by water, while the fractures and angles of others are quite sharp, having received little or no wear. From the fact that some of the specimens submitted for examination had received little or apparently no abrasion, it was thought that they might have been originally imbedded at the spot where found, and that the deposit might possess interest from a paleontological standpoint.

The layer in which the remains occur is a pavement of coarse gravel,
pebbles, and cobble-stones, some of considerable size, indicating the conditions usually found in the beds of streams. The writer is of the opinion that during the close of the Pleistocene, or later, there flowed through this valley a water-course of considerable size, which excavated Pleistocene remains from places where they had been originally imbedded, probably not far distant, and redeposited them in the spot where they are now found.

Fragments of large shells were found immediately overlying the stratum containing the bones of vertebrates. Dr. A. E. Ortmann after examination decides them to be fragments of fluviatile mollusks. The finding of the tooth of a large crocodilian, described in this paper, furnishes further confirmation of the view that a stream of considerable size, perhaps of greater volume than the Holston River at present, once flowed here.

The remains found in the opening at the edge of the sink-hole at “Well No. 69” are herewith listed, so far as it has been possible to determine, at least approximately, what they are.

Class REPTILIA
Order CROCODILIA.
Genus Crocodilus Laurill. (?) sp. ind.

A tooth (No. 3953, C. M. Cat. Vert. Foss.), which is shown in half the natural size in Fig. 3, was discovered among the scattered remains recovered at “Well No. 69.” It is 100 mm. in length, 30 mm. in antero-posterior diameter at crown, and 24 mm. in transverse diameter at same point. The enamel has been more or less abraded, but nevertheless the tooth does not appear to have been transported very far, or much subjected to the action of running water. The apex of the crown, which is somewhat broken, terminates in a blunt rounded point; the shaft is a little curved. (Note. The tooth undoubtedly represents a very large Crocodilian, but to which of the various extinct genera it is to be referred cannot now be definitely decided. Recently one of his correspondents has informed the writer of this parenthetic note that discovery has been made by him of Crocodilian

![Fig. 3. Crocodilian tooth. ½ nat. size.](image-url)
remains in North Carolina, which appear to be identical with the material from Montana described under the generic name Deinosuchus. (See Ann. Carnegie Museum, Vol. VI, pp. 28–294.) It is barely possible that this great tooth, recovered at Saltville, may belong to this or an allied genus, which survived to a quite recent geologic period. At all events the tooth represents an animal much larger than any living species of the order now existing, at least in the New World. W. J. Holland.

Class MAMMALIA.

Order EDENTATA.

Family MEGALONYCHIDÆ.

Genus Megalonyx.


The symphyseal portion of a pair of lower jaws (No. 3952 C. M. Cat. Foss. Vert.) found at "Well No. 69" is provisionally referred to M. dissimilis Leidy. The teeth of this specimen remaining in position are slightly larger, but have the same laterally compressed appearance and outline in cross-section, as given in Fig. 8 of Plate XVI of Leidy's "Extinct Sloth Tribe of North America," Smithsonian Contributions to Knowledge, June, 1855. While the teeth of the present specimen appear to be as large as those of Megalonyx jeffersonii described in the same publication, the symphysis clearly has a smaller transverse

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Fig. 4. Megalonyx sp. Symphyseal portion of lower jaw, viewed from above and behind. $\times \frac{1}{2}$.

Fig. 5. The same, with the back portion of jaw removed, showing the proximity of the roots of the teeth. $\times \frac{1}{2}$. 
diameter than is shown in the ramus delineated on Plate V of Leidy's paper, and is also too narrow to correspond with the upper jaw illustrated on Plate III of the same paper. Furthermore the alveolus of the second tooth in the present specimen is further forward and the ramus of this region is shallower than represented in Prof. Leidy's illustrations of *Megalonyx jeffersonii*. The transverse diameter of the symphysis and the distance between the canine molar and the succeeding tooth of No. 3952 agree better with *Megalonyx leidyi* found in McPherson County, Kansas, and described by Dr. Josua Lindahl. The specimen recently obtained by the Carnegie Museum may possibly belong to an unpublished species, but, as the specimen is rather inadequate as a type, I refrain from adding another species to those already proposed. The number of species of this genus of North American Ground Sloths, based upon somewhat limited material, indicates either that there were many species, or that there was a wide range of individual variation.

Order **ARTIODACTYLA.**

Family **CERVIDÆ.**


The first upper premolar and the greater portion of the pedicel of an antler were found by different parties in the bank of the cave-in at Saltville. These specimens are now the property of the Saltville High School. Mr. H. L. Crowgey, in charge of the school, kindly submitted the specimens to the writer for study.

The portion of antler, which I take to be the pedicel, has very nearly the size of that of a fully adult moose, but is longer. The long pedicel,

![Fig. 6. First upper premolar of Cervalces](image1)

![Fig. 7. Astragalus of Cervid.](image2)

which is one of Professor Scott's generic characters of Cervalces (l. c., p. 183) is my chief reason for referring the specimen to that genus. The premolar here referred to is larger than that of C. vapiti, but proportionally narrower. It is, however, considerably smaller than that of Alces, and furthermore differs from the latter by having a relatively smaller transverse diameter, and deeper concavities of the outer face of the ectoloph.

**Cervid.** sp. ind.

An astragalus (No. 3951, C. M. Cat. Foss. Vert.) was found by the writer in the same place in which the remains just described were collected. This bone agrees closely with the same bone in Oidocoileus virginianus, but is too large for that species, and much too small to represent a moose.

**Order PERISSODACTYLA.**

Subfamily Equinae.

Gen. Equus sp. ind.

An upper molar of the left side was found in the opening at Saltville and presented to the high school of the place by Mr. George Lipperd. The tooth represents a fully adult animal, but is too much mutilated to permit correct identification.

**Order PROBOSCIDEA.**

Subfamily Mastodontinae.

Genus Mastodon.

**Mastodon americanus** Kerr.

Remains of mastodons are by far the most common in the Saltville deposit. Isolated teeth, fragments of jaws, portions of vertebrae, ribs, limb-bones, and foot-bones of both adult and young individuals are frequently found while working in this locality. Not only at the opening at "Well No. 69" but at different other places throughout the valley remains of mastodons have been picked up from time to time for a number of years past and are now located in different institutions. A few fragments of teeth and other bones were collected for the Carnegie Museum. While fragments of ribs were plentiful, no complete rib was found.
Fig. 1. Saltville Valley. The pools in the middle distance represent old sink-holes. The recent cave-in is designated by the white cross at the right.

Fig. 2. Near view of cave-in at "Well No. 69," Mathieson Alkali Works, Saltville, Virginia.

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