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## THE ORLETON FARMS MASTODON

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In November, 1949, some workmen at Orleton Farms, Madison County, Ohio, were probing with an iron rod to locate a plugged drain tile. Striking a hard object, they made an excavation, finding instead of a tile a large mammal bone. The manager of the farms, Mr. W. G. Putnam, notified members of the staff of The Ohio State Museum, who identified the specimen as that of the mastodon, *Mammul americanum*. Arrangements were made to excavate the site.

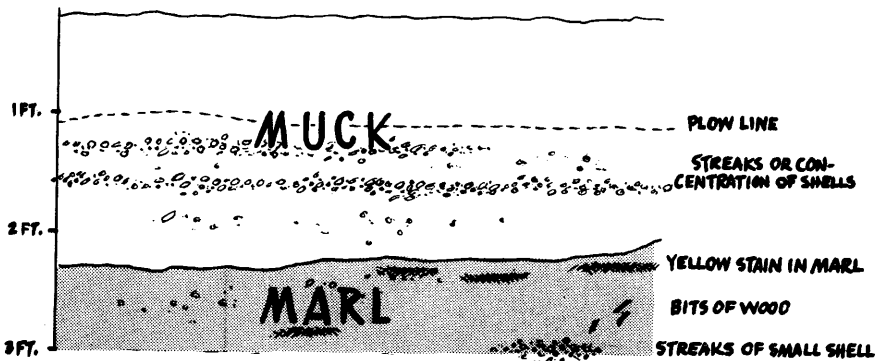


FIGURE 1. Diagrammatic section of excavation. The skeleton of the mastodon was imbedded in the marl layer, extending up into the muck layer above.

The work was done under the supervision of Mr. Raymond S. Baby, Curator of Archaeology, and the writer. Mr. Robert M. Goslin, assistant in Natural History at the Museum, who has had much experience in archaeological excavation, was actively in charge. Mr. Putnam and Miss Mary Johnstone, owner of Orleton Farms provided all possible assistance to the project.

The site of the find is in Somerford Township, Madison County, about  $11\frac{1}{2}$  miles northwest of West Jefferson. It is located a few hundred feet northeast of State Route 29 and about 2 miles west of the village of Plumwood. The bones were found in a low place in gently rolling ground moraine, which Dr. Richard P. Goldthwait, glacial geologist, Ohio State University, considers probably material of the Cary stage of the Wisconsin Age.

Excavation showed that the bones were lying on and in a layer of limy clay or marl about 1 foot in thickness which extended to a depth of about 3 feet. The marl lies upon the glacial till. Above the marl layer is a layer of black muck or peaty material about 2 feet in depth. Shells of Mollusca and Ostracoda were

plentiful in both the muck and the marl, forming conspicuous windrows or horizontal streaks in places.

The uppermost portions of the skeleton averaged about 1 foot 8 inches below the surface, with a range between 1 foot 4 inches and 2 feet 2 inches. It was so close to the surface, in fact, that the ditching machine which cut the trench for the original tile line removed a portion of the top of the skull.

In order to secure as complete a picture of the conditions under which the animal lived, a number of specialists were called into consultation. Dr. Goldthwait



FIGURE 2. View of excavation. The skull is beneath the drain tile at the back of the pit. Photo by courtesy of Columbus Dispatch

visited the site on a number of occasions and made a study of the glacial geology. Dr. E. N. Transeau, plant ecologist, Ohio State University, Dr. Paul B. Sears, specialist in fossil pollens, Yale University and Mr. William H. Sassaman, comparative anatomist, Western Reserve University also paid visits to the site. Specimens of Mollusca from the excavation were submitted to Dr. Aurèle La Rocque, paleontologist, Ohio State University. A number of bones which had been gnawed by rodents were examined by Dr. Albert E. Wood, Amherst College.<sup>1</sup>

<sup>1</sup>Reports of Drs. Goldthwait, La Rocque, Sears, and Wood appear in this number of *The Journal*.

Dr. George Gaylord Simpson, American Museum of Natural History, and Dr. Robert W. Wilson, Museum of Natural History, University of Kansas, also provided valuable information and comments.

The skeleton proved to be badly disturbed and the bones crushed and broken. As an example of the amount of disturbance, one of the ribs lay beneath one of



FIGURE 3. Some of the large bones in situ. The femur in foreground has been broken square across. Photo by courtesy of Columbus Dispatch.

the tusks, while another was thrust through an aperture in the pelvis; a shoulder blade rested to the right of the skull and one of the large neck vertebrae was found about ten feet from the skull, near a portion of the pelvis. In spite of the wide dislocation of the parts, the bones of one of the feet remained intact and in place, very possibly in the spot where the animal last stepped.

Even the largest of the bones, such as the thigh bones, were broken squarely across in places, indicating that some considerable force had been exerted upon them. While any conclusion as to an agency powerful enough to cause such destruction must be highly speculative, trampling by other mastodons seems to me to be a reasonable explanation.

A number of the bones had been gnawed by rodents, the tooth-marks varying considerably in size. Dr. Wood is of the opinion that the marks were caused by a number of different species of rodents. The tooth-marks are taken as an indication that the skeleton was exposed above the surface of the ancient marsh, at least periodically, since it is believed that rodents, with the exception of beaver or muskrat, would not be likely to gnaw bones beneath the surface of the water.

Dr. La Rocque reports that the populations of mollusca are very different in the upper black layer from those in the lower gray marl layer, indicating that very different ecological conditions existed at the times when the two types of material were being deposited.

It appears altogether likely that the site was originally covered by a shallow pond, with scanty vegetation, fed by surface water and springy seepages from the surrounding moraines. The water which fed the pond must have carried good quantities of lime in solution and this, along with suspended silt, was precipitated eventually to form the marly deposits in the bottom of the depression. As the depression became partly filled with sediments, swamp vegetation was able to invade, the decomposition of which resulted in the upper layers of black, fibrous, peaty material. The pond probably was not so deep that portions of the mastodon skeleton were not exposed during occasional droughts over considerable periods of time.

Dr. Sears reports pollen of fir, spruce, and pine in the lower deposits, indicating a coniferous forest surrounding the pond at the time at which the animal was alive, much the same as now obtains in the northernmost portions of the United States and parts of Canada.

The epiphyses of the bones had not yet united. Mr. Sassaman and Mr. Baby estimated that the condition of the epiphyses corresponds with that of a 14-year old human being. This, of course, is not to be interpreted as indicating the age of the animal, since the age at which the epiphyses unite in mastodons is not known. That the specimen was sub-adult is also borne out by the small size of the tusks and by the teeth.

Each jaw had the following tooth arrangement from front to rear: (1) a small, badly worn molar, 3 inches long, with 3 crests or cusps and apparently about ready to be shed, (2) a molar  $3\frac{1}{2}$  inches long, with three cusps, which was performing most of the work, (3) a molar  $4\frac{1}{4}$  inches long, with 3 crests, with only the foremost crest showing any wear, and (4) a large molar  $6\frac{1}{2}$  inches long, with 4 crests plus a small additional one, embedded in the jaw and as yet without roots. The first tooth is interpreted as the last deciduous tooth, the remaining three being the true molars.

In spite of the fact that the animal was sub-adult, it was a large individual. One thigh-bone measures 42 inches and is comparable in size to those of the well-known Warren Mastodon in the American Museum of Natural History, which is a large animal.

Samples of muck, marl, and bones were sent to the Institute for Nuclear Studies, University of Chicago, in order to secure a dating by the radioactive carbon 14 technique, but no report has as yet been received.

A number of pieces of wood were found in the marl immediately beneath the skeleton and in the lower strata surrounding it. These were submitted to Dr. Richard A. Popham, Ohio State University, for identification, but the cellular structure had been destroyed beyond recognition. The wood was then sent to The Harrison M. Randall Laboratory of Physics, University of Michigan, for

analysis by the carbon 14 method. Dr. H. R. Crane, of the Laboratory, reports that the radiocarbon age determination of the samples gives  $8420 \pm 400$  years ago. The work at the Laboratory is supported by the Michigan Memorial-Phoenix Project.

Found among the mastodon bones were two fragments of the tibia and a talus of a deer and the claw of a large bird of prey. Another interesting find was a spear-point of chert  $3\frac{1}{2}$  inches in length. It was located about 5 inches above the lower end of one of the mastodon femurs and 14 inches from the surface. Mr. Baby and Mr. Goslin have pronounced it to be an early type of point. It unquestionably is not contemporaneous with the mastodon bones, but it is undoubtedly of considerable antiquity, probably dating prior to 500 B. C.

The presence of the bones of the various animals and the spearpoint in this site indicates that it may have been a favorite water-hole for animals, to which early men came in search of game.

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