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A NEW MASTODON, *SERRIDENTINUS MEADENSIS*, FROM THE MIDDLE PLIOCENE OF KANSAS

BY

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INTRODUCTION

THE mastodon tooth described here is the only vertebrate fossil known to have been recovered from the Middle Pliocene Ogallala formation of Meade County, Kansas. Many vertebrate fossils, however, have been found in the continuation of these strata to the east in Clark County. The specimen from Meade County was collected in the Borcher gravel pit, 7½ miles south and 2¼ miles west of Meade, Kansas, by Mr. J. A. Pauls of Minneola, Kansas, who donated it to the University of Michigan Museum of Paleontology.

The mastodon tooth belongs to an individual of the *Serridentinus* group of short-tusked mastodons, which first appeared in Eurasia, arrived in North America during the Miocene, and lived until near the close of the Pliocene. These mastodons were browsers that ranged from California to Florida and fed in scrubby or timbered areas.

SYSTEMATIC DESCRIPTION

Serridentinus meadensis, sp. nov.

(Pls. I–II)

Holotype.—No. 24377, University of Michigan Museum of Paleontology; a left M_3, collected by J. A. Pauls of Minneola, Kansas.

Horizon and type locality.—Middle Pliocene, Ogallala formation. Borcher gravel pit, east side of Crooked Creek, NE.¼ sec. 20, T. 33 S., R. 28 W., Meade County, Kansas.

Description of holotype.—The tooth is from an adult animal. It has 4½ ridge crests. The half ridge crest (pentalophid) is greatly reduced. It consists of only two small rounded conelets. The external conelet is the larger. The greatest anteroposterior length of the tooth is 200.0 mm. The greatest transverse width is 85.0 mm., measured across the base of both the second and third lophids (the metalophid and trilophid of Osborn, 1936, p. 141). Only the first and second ridge crests are worn. The ridge crests of the third and fourth lophids are rounded on top. Due to the flattened anterior and posterior faces of the first and second lophids the tooth appears intermediate between the blunt ridge-crested and sharp ridge-crested species of *Serridentinus*. The tooth is strongly curved, concave along the labial base and convex along the lingual base. The protolophid and metalophid are inclined forward, as in *Serridentinus floridanus* Leidy and *S. obliquidens* Osborn. It is distinguished from these forms by a more nearly vertical trilophid and by its compressed proto- and metalophids.

Serridentinus meadensis is also distinguished from known species of *Serridentinus* by the lack of conelets along the external cingulum and in the valleys between the lophids. Only two conelets occur on the inner cingulum. The larger conelet is between the protolophid and metalophid and the other conelet is between the metalophid and trilophid (see Pls. I–II). Two similar conelets appear in *Serridentinus republicanus* Osborn, a form lacking the compressed protolophids and metalophids, from the Lower Pliocene of Kansas, though the conelets are not as large as those in *S. meadensis*.

Serridentinus meadensis is the size of *S. progressus* Osborn from

Driftwood Creek, Hitchcock County, Nebraska, but is distinguished from the latter by the presence of the two well-developed internal conelets between the anterior lophids and the reduced pentalophid.

STRATIGRAPHY

Pliocene deposits in Kansas having a typical "Mortar bed" appearance have been assigned to the Ogallala formation. For a discussion of these deposits see Elias (1931, p. 131) and Smith (1940, p. 39). In southwestern Kansas and northwestern Oklahoma the Lower Pliocene deposits possess a distinctive lithology and are known as the Laverne formation. So far as known the Middle Pliocene beds of southwestern Kansas do not overlie the Laverne formation, but large pieces of reworked Laverne silt and clay have been observed in them in the Borcher gravel pit in Meade County. Outcrops of the Ogallala formation in Meade County are confined approximately to the southeastern quarter of the county.

East of Meade, Kansas, along the Meade–Clark county line, the Ogallala rests unconformably upon Cretaceous strata; as one goes southwestward toward the Meade Basin the Cretaceous rocks thin out and the Ogallala, at the Borcher gravel pit, rests unconformably upon Permian deposits. Numerous contacts of the Ogallala with the Permian are seen along Crooked Creek Valley beginning upstream from the Borcher gravel pit and extending downstream in southeastern Meade County. The flood along Crooked Creek the last of May, 1951, exposed the contact between the Permian and Ogallala at the site of the Borcher pit.

The Borcher gravel pit is in the southeast corner of sec. 17 and the northeast corner of sec. 20, T. 33 S., R. 28 W. In 1941 a state highway was built through the Borcher pasture along the section line. The part of the gravel pit located in the southeast corner of sec. 17 has been abandoned.

The lithologic character and thickness of the strata of the Borcher pit and adjacent area are shown in the following section, measured by Frye and Hibbard, beginning on the floor of the Borcher gravel pit in the northeast corner of sec. 20, thence eastward to the caliche zone above the Pearlette ash in sec. 21, T. 33 S., R. 28 W.

Section of strata of the Borcher gravel pit and adjacent area, modified after Frye (1942, p. 98). Frye's location should read sec. 21 instead of sec. 12.

	Thickness feet
Crooked Creek formation (Pleistocene)	
Total thickness exposed	68.2
Unconformity	
Ogallala formation (Middle Pliocene)	
9. Caliche, sandy, gray-tan	5.41
8. Silt, fine sand, and some clay, tan to buff, massive	1.6
7. Sand, fine and some silt, yellow-tan, thin-bedded	1.0
6. Sand and silt, reddish tan, massive	4.0
5. Unexposed	2.9
4. Caliche, sandy, nodular, massive, with vertical nodular stringers of caliche, and pockets and lenses of pinkish-tan sandy silt	11.2
3. Sand, silt, and clay, pinkish-tan, with some nodular bands of caliche and some gravel	6.1
2. Sand and gravel, cross-bedded, in tightly cemented and loose lenses; gravel quite coarse in some lenses, with blocks of red Permian siltstone; unit coarser and more poorly sorted upward; a "Mortar bed" at top with seeds of *Biorbia fossilia* (Pl. III); *Serridentinus* tooth from some loose sand or gravel of unit	34.6
1. Unexposed. A nearby test hole shows this interval to be occupied by sand and gravel overlying Permian red beds	11.2
Total thickness of Ogallala formation	78.01

The dating of these beds was formerly based on seeds of *Biorbia fossilia* (Berry), taken by Hibbard, July 5, 1937, from the top of the "Mortar bed" capping the Borcher gravel pit and from silts near the top of the exposure in the NW.¼ sec. 21, T. 33 S., R. 28 W.

A continuation of these beds crops out approximately four miles south of the Borcher gravel pit on the southwest side of Crooked Creek where the creek turns southeastward. The beds are exposed in T. 34 S., R. 28 W. in the S.½ sec. 8; SW. corner of sec. 9; W.½ sec. 16; sec. 17; the east edge of sec. 18; NE. corner of sec. 19; most of sec. 20; the W.½ sec. 21; the NW. corner of sec. 28; and the NE. corner of sec. 29. Here the base of the Ogallala is not exposed. There is no evidence that Pleistocene deposits have ever covered this entire area, which is in contrast to the area at the Borcher gravel pit where

more than 60 feet of Pleistocene deposits cover the Ogallala beds. Along the north side of this area the Stump Arroyo sand and gravel member, Pleistocene, of the Crooked Creek formation rests on Ogallala deposits. The Ogallala beds here were mapped by Frye (1942, Pl. 1) as the Rexroad member of the Ogallala. The lithologic character and the thickness of the Ogallala formation are shown in the following description of the exposed section.

Section of strata exposed approximately in the NW. corner of sec. 17, T. 33 S., R. 28 W. (see Pl. IV, Figs. 1–2).

	Thickness feet
Topsoil	
Ogallala formation	
7. Silt and fine sand with calcium carbonate concretions. "Mortar bed" at top. Weathers to a caliche-like rubble	11.5
6. Silt with clay and fine sand, reddish buff	11.0
5. Sandy silt, light red with few stringers of caliche	6.75
4. Sandy silt with fine gravel, mottled with caliche	6.5
3. Fine to coarse sand with some small gravel	2.0
2. Sandy silt, gray, weathers to typical "Mortar bed"; weathered surface hard (remains of land turtle found 2 ft. above base of bed)	9.0
1. Sandy silt and clay, mottled light brown and white due to presence of calcium carbonate in small concretions and thin seams of caliche	4.0
(Base covered)	
Total thickness	50.75

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EXPLANATION OF PLATE I

PAGE

Serridentinus meadensis, sp. nov. 218

Holotype, U.M.M.P. No. 24377, left M_3, occlusal view. Approximately natural size.

PLATE I

PLATE II

EXPLANATION OF PLATE II

PAGE

Serridentinus meadensis, sp. nov. 218

Holotype, U.M.M.P. No. 24377, left M_3, lingual view. Approximately natural size.

EXPLANATION OF PLATE III

FIG. 1. Borcher gravel pit, NE.¼ sec. 20, T. 33 S., R. 28 W., at base of Ogallala formation. "Mortar bed" caps exposure and contains seeds of *Biorbia fossilia.*

FIG. 2. Close-up view at base of pit, showing cross-bedded sand and gravel from which the tooth of *Serridentinus meadensis* was recovered.

PLATE III

FIG. 1

FIG. 2

PLATE IV

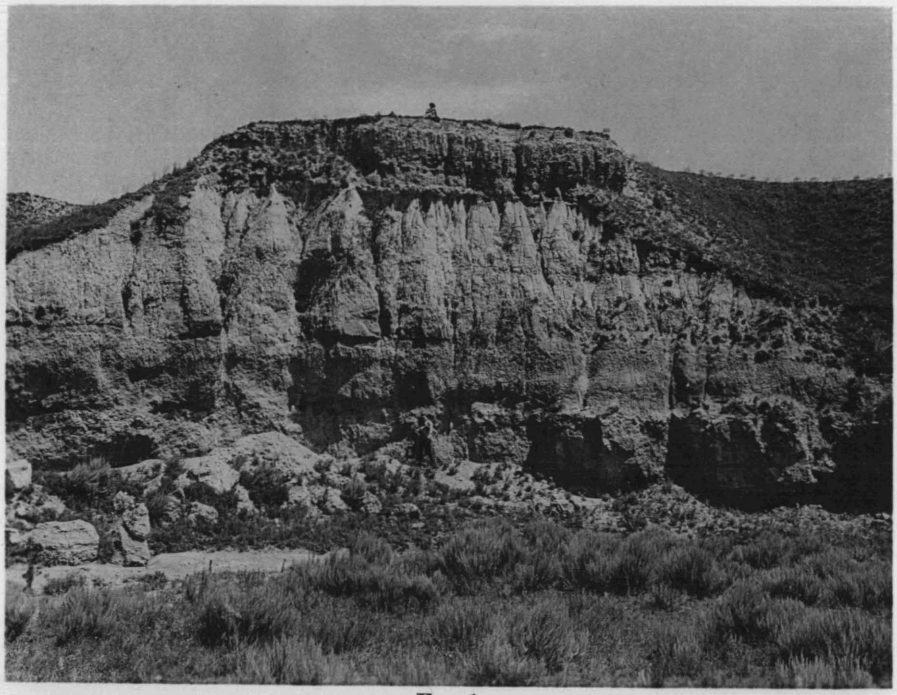

FIG. 1

FIG. 2

EXPLANATION OF PLATE IV

FIG. 1. Upper part of Ogallala formation approximately 4 miles south of Borcher gravel pit near the NW. corner of sec. 17, T. 34 S., R. 28 W. Note "Mortar bed" at base of exposure.

FIG. 2. View to the right of Figure 1, showing weathered "Mortar bed."

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