

Evidence of the Mastodon in Hendricks County

ALBERT E. REYNOLDS, DePauw University

While plowing to plant oats during the spring of 1961, Mr. Larry Alkire turned up a large tooth which he subsequently placed on display at the Farm Supply Store in Coatesville, Indiana. Through the agency of Dr. John Ellett, Coatesville physician, the tooth was brought to the attention of the author and the opportunity provided for making this study and report. Grateful acknowledgement is hereby made to all concerned for this cooperation, and to Dr. C. L. Bieber, Department of Geology, DePauw University, for consultations and advice.

The very large size and weight (2.75 lbs. or 1.25 Kg.) of the tooth made it at once apparent that only a very large animal such as a proboscidian could have produced it. Further taxonomic allocation of the tooth was based on structural criteria mentioned in 1792 by the Scottish naturalist Robert Kerr concerning mastodont teeth: "But the grinders are totally different, being covered uniformly with enamel, and furnished with a double row of high conic processes, like those of carnivorous animals; whereas those of the elephant are composed of alternate perpendicular layers of bone and enamel, and are ribbed transversely on their upper surfaces, like those of graminivorous quadrupeds" (Osborn, 2). Since the tooth discovered by Mr. Alkire exhibited three sets of "high conic processes," it was obviously a tooth from a specimen of *Mastodon americanus* Kerr (Osborn, 2).

Description and Diagnosis

The tooth was essentially complete, and in a relatively good state of preservation, although fissured by several cracks and having sustained the loss of a few pieces. Root and crown of the tooth were quite sharply delimited by the line of junction between the cement covering former and the enamel covering the latter (Figs. 1, 3), a line of demarcation that must have been very close to the gum-line of the living Mastodon. The shiny, glistening enamel of the crown, varying from 3.3 to 6.0 mm in thickness, was black in color except for a bluish-white area on the facing slopes of the ridges, and a white-spotted-with-black area located on the lower postero-lateral portion of the crown (Fig. 3). The cement covering the root presented the aspect of a brownish, bark-like layer, varying from 0.7 to 1.5 mm in thickness. In both crown and root, breakage had exposed the underlying dentine which was different from both enamel and cement in texture, and was brownish-white or gray-white in color. The tooth was 130.3 mm in total length, and, measured at its widest, was 77.0 mm wide at the anterior end, 93.0 mm wide at the posterior end; greatest length and width occurred just above the cement-enamel junction line.

The crown or grinding surface was thrown into three transverse ridges separated by two parallel grooves about 40.0 mm deep (Figs. 2, 3). Each ridge was bisected by a longitudinal furrow approximating 6.0 mm in width and 3.0 mm in depth on the ridge slopes, but which formed on the ridge crests a widely-divergent V-shape about 12.0 mm in depth (Figs. 1, 2). This longitudinal furrow converted each ridge into a partial cone (conule), thus creating the "double row of high conic processes" mentioned by Kerr. A longitudinal ridge, approximating 12.0 to 14.0 mm in

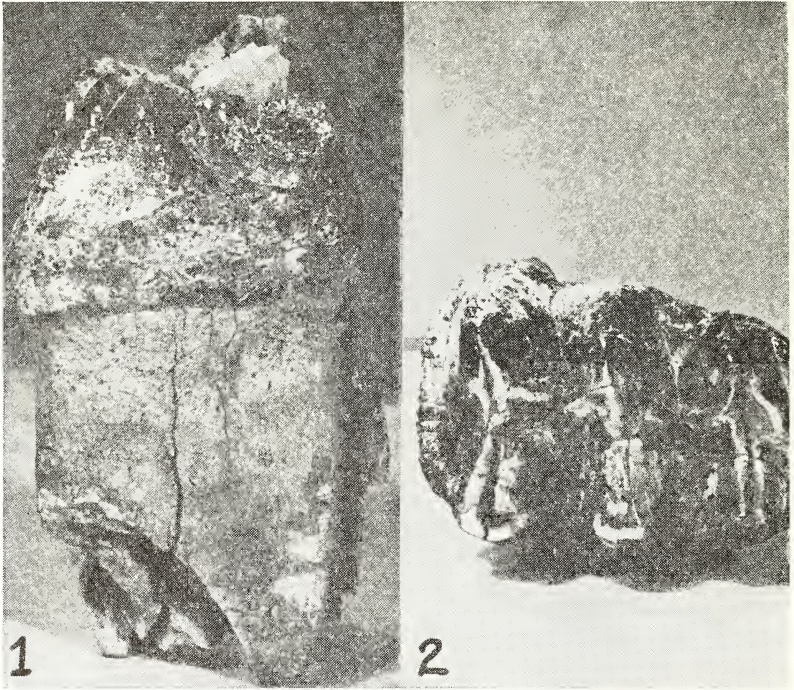


Figure 1. Mastodon tooth as seen from posterior end, lateral or cheek side to the left. Note: (1) steeper grade on medial side of crown, more slope on lateral side, (2) line of enamel-cement junction, (3) longitudinal groove forming widely-divergent V which divides transverse ridges into conules, (4) bilateral fusion of root material into one solid mass. (x $\frac{1}{2}$, approximately).

Figure 2. Tooth as seen from top or grinding surface, cheek or lateral side uppermost, anterior end to the right. Note: (1) three transverse ridges slightly oblique to the longitudinal tooth axis, (2) longitudinal groove, above (lateral to) which occurs buttress-like longitudinal ridge, (3) small amount of wear evident on anterior conules to the right (other conules have suffered breakage, more pronounced on posterior conules). (x $\frac{1}{3}$, approximately)

width and rising to a height of 4.0 mm ran up the six slopes of the three lateral conules, thus giving them a buttressed appearance. Measured as vertical distance above the cement-enamel junction line, crown height for the five most complete conules varied from 57.0 to 60.0 mm. On both front and back of the crown, a row of quite small but closely-approximated conules formed a transverse ledge-like ridge known as the cingulum.

In the root of the tooth there was evidence of a tendency for there to be a root under each of the six conules of the crown, but extensive fusions had occurred. Bilaterally, the anterior and posterior pair had fused into one mass of root (Fig. 1), while the middle pair retained bilateral distinctness. From anterior to posterior, the middle pair of roots had fused with the posterior pair (Fig. 3), and to a greater degree laterally than medially. No root was completely represented due to breakage and loss,



Figure 3. Tooth as seen from lateral or cheek side, anterior end to the left. Note: (1) enamel-cement junction line, (2) three pronounced transverse ridges, (3) lack of fusion of anterior roots with those behind, (4) root dentine showing where cement was chipped off. (x $\frac{3}{4}$ approximately)

but the three most complete measured from 102.0 to 107.0 mm in length from the cement-enamel junction.

Diagnosis of this tooth as to exact position among the 24 cheek teeth of the Mastodon was based on criteria given by Hay (1). Allocation to the lower jaw was based on the fact that the transverse ridge axes were somewhat oblique to a true right angle with the longitudinal axis of the tooth (Fig. 2). Antero-posterior orientation was based on the fact that the anterior roots of the lower jaw were unconnected with the roots behind (Fig. 3); furthermore, in the Mastodon the anterior end of such teeth erupted first and was subjected to abrasion and wear earlier and longer than the rest of the tooth. In this tooth one pair of conules showed some

wear (Fig. 2), the same conules that occurred above the distinct and non-fused roots (Fig. 3). Bilaterality was adjudged by the slant or slope of the sides of the transverse ridges: more slope on the lateral or cheek side, much steeper on the medial or tongue side (Fig. 1). In this tooth the deviation from vertical was between 10° and 15° on the tongue side, between 25° and 30° on the cheek side. On the basis of these criteria the tooth was allocated to the left lower jaw; finally, the exhibition of three transverse ridges and its length and width placed it as the second true or permanent molar. This diagnosis has been confirmed by careful comparison with illustrations, figures, and descriptions given by Osborn (2).

The Site of Discovery of the Tooth

The Alkire farm lies in Hendricks County, east and somewhat south of Stilesville, Indiana, in Section 30, Township 14 North, Range 1 West, and is part of a general area known as "the bottoms" and "the lake country." The entire area is generally low and quite flat; there are places where elevation differences of ten feet are as much as one mile apart (4). According to older natives of the area it was once very swampy; the excavation of "public ditches" and the occasional dredging of the natural streams have been the measures that have rendered the land tillable. The Alkire farm is traversed by Mud Creek, about fifty feet from the west bank of which the tooth was plowed up; this spot may be located approximately as latitude $39^\circ 37' 30''$ North, longitude $86^\circ 33' 40''$ West.

The studies of Thornbury (3) reveal that the Alkire farm is land once covered by the most northeasterly arm or extension of glacial Lake Eminence, a lake that covered an area of approximately 30 square miles. It had a very irregular outline, with many finger-like extensions. One such extension lay in a northeast-to-southwest direction, generally parallel to the present course of Mud Creek, and at the level of the Alkire farm this extension was approximately one mile in width according to Thornbury's map (3). According to Thornbury's analysis, the retreat of the Wisconsin ice sheet left a morainal deposit which blocked run-off to the southwest and thus backed up the waters into Lake Eminence, which probably had a spillway into Lamb's Creek southwest of Hall, Indiana. Drainage was eventually established to the southwest by way of the present Mill Creek. The area under consideration has thus had, evidently, a long history as a swampy region, and the discovery of Mastodon remains in the area is consistent with the general experience that swamps have been the sites in which most such remains have been found (Hay, 1; Osborn, 2).

Summary

A large tooth plowed up in Section 30, Township 14 North, Range 1 West, Hendricks County, Indiana, was identifiable as the second true molar from the left lower jaw of *Mastodon americanus* Kerr. The tooth was illustrated and described in quantified terms. The site of discovery was near Mud Creek on land once covered by Lake Eminence of the late Wisconsin glacial epoch, land that has had a history of being swampy until fairly recent times.

Literature Cited

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