

## THE LEWIS MASTODONT (*MAMMUT AMERICANUM*) LOCALITY, WABASH COUNTY, NORTH-CENTRAL INDIANA

Luke L. Hunt  
Whitko High School  
1 Big Blue Avenue  
S. Whitley, Indiana 46787  
and  
Ronald L. Richards  
Indiana State Museum  
Department of Natural Resources  
202 North Alabama Street  
Indianapolis, Indiana 46204

**ABSTRACT:** The remains of an adult mastodont (*Mammut americanum*) were unearthed by highway construction crews in 1990 while they were working on Meridian Road in northern Wabash County, Indiana. The remains occurred in a peat deposit at a depth of about two meters. Peat and clay excavated from the site were deposited in a nearby field, where our recovery efforts were concentrated. The bones were extensively damaged by the heavy construction equipment. The amount of skeletal material removed during construction is unknown, but portions of approximately 40 percent of the skeleton were retrieved. Radiocarbon dating of the mastodont bone indicated an age of 11,160 B.P. Analysis of pollen from the tusk cavity indicated that an open, spruce-dominated woodland covered the region at the time of deposition.

### INTRODUCTION

On 17 September 1990, a highway construction crew working on Meridian Road 4.2 km northwest of North Manchester discovered a large tooth in the earth being removed from the roadway. The project was located approximately 300 m south of the Wabash/Kosciusko County line (SW<sup>1</sup>/<sub>4</sub>, NW<sup>1</sup>/<sub>4</sub>, NW<sup>1</sup>/<sub>4</sub>, Sec. 19, T30N, R7E, North Manchester North Quadrangle). Approximately 16,000 cubic meters of excavated roadway material was transported by truck to a field on the Lewis farm about 1.6 km south of the deposit. The material included asphalt chunks from the road, logs from the original corduroy road, previously transported road bed materials, as well as peat and clay removed in widening the roadway. Among these materials, unknown to the construction crew, were interspersed the remains of a mastodont. With news of the tooth discovery, Mrs. Bud Lewis contacted archaeologists at Ball State University, who in turn referred her to the junior author (R.L.R.) at the Indiana State Museum. With permission from the Lewis family, Richards and volunteers surveyed the refuse heaps on September 21, recovering portions of several proboscidean ribs. Richards in turn contacted Luke Hunt, a science teacher at nearby Whitko High School, who then directed the effort to recover the dispersed skeleton and any other pertinent associated materials.

The project geotechnical report (Butler, Fairman, and Seufert, Inc.) indicated the following stratigraphy at sounding PS-14 near the site: topsoil (0-19 cm), peat and clay (20-136 cm), sand (137-155 cm). The level at which the mastodont remains occurred is uncertain, but the remains are thought to have been encountered in peats and clays at a depth of about 2 m.

The mastodont locality lies within the southern margin of a belt of hills and kettle holes historically referred to as the "Packerton moraine" (Wayne and Thornbury, 1951). The Packerton feature is a recessional edge moraine of Trafalgar ice (East White sublobe, Huron-Erie Lobe, Wisconsinan glaciation; Bleuer and Melhorn, 1989; Gray, 1989). The Packerton was once thought to be a terminal moraine of the northeastern source Saginaw lobe (Wayne and Thornbury, 1951; Schneider and Johnson, 1967), which now appears to have terminated further to the north. The stagnant ice topography of the Packerton feature was later blanketed by a thin veneer of Lagro sediments (often too thin regionally to show on Gray's 1989 glacial geology map). Lagro ice (Miami sublobe, Huron-Erie Lobe) advanced from its northeastern source into Wabash County sometime after the "Erie Interstade" (approximately 15,500 B.P.) and by approximately 14,800 B.P. had receded back to near the eastern Indiana border (Fort Wayne Moraine; Mickelson, *et al.*, 1983). After stagnation and melting of Lagro ice, marl and peat began accumulating in kettles and other basins. These sediments were deposited within the past 13,000 years and occasionally contain the remains of mastodonts and other extinct mammals (Wayne, 1963). The Lewis mastodont was deposited in one of these basins.

The American mastodont (*Mammuthus americanus*) was widespread throughout the United States during the Late Pleistocene (Kurtén and Anderson, 1980). Living animals stood between 2.7-3.0 m at the shoulder (males). They may have preferred to live in open spruce woodlands, lowlands, and swamps. Their diet may have included twigs and cones of conifers, leaves, coarse grasses, swamp plants, and mosses. The mastodont was extinct by 9,000 B.P. (Kurtén and Anderson, 1980).

Other published records of large Late Pleistocene mammals recovered from Wabash County include two specimens of both the American mastodont and the mammoth (*Mammuthus* sp.; Elrod and Benedict, 1892; Hay, 1912) and one specimen of the flat-headed peccary (*Platygonus compressus*; Cope and Wortman, 1884; Hay 1912). The remains of an elk (*Cervus elaphus*) were probably of Holocene age (Elrod and Benedict, 1892; Hay, 1912). Additional unpublished mastodont finds have also occurred in Wabash County.

## METHODS

Retrieval efforts were undertaken from 20 September 1990 to 13 December 1990. Help came from teachers, college students, high school, middle school, and elementary school students, parents, and other interested individuals. Because the original site was under development (as well as under water), the recovery effort focused upon the excavated peat and clay on the Lewis farm. The search involved the use of shovels, rakes, hoes, hand spades, and tile probes. Most pieces of the skeleton were recovered during the removal of small increments of sediment from a vertical bank face while digging horizontally through select piles. Probing was ineffective. Cleaning and preservation were conducted at Whitko High School. Bone materials were washed and brushed under tap water, and slowly dried in plastic bags ventilated with small holes. Drying required two to three months. The bones did display some warping and checking as a result of drying. Dried bones were then coated with Vinac B-15 dissolved in alcohol to a consistency of syrup. The teeth were consolidated with glyptal (driven with acetone) under vacuum at the Indiana State Museum.

A section of mastodont rib (640 g) was submitted to the Illinois State Geological Survey for radiocarbon dating. A sample of sediment from deep within the tusk cavity

was submitted to Donald Whitehead, Department of Biology, Indiana University, for pollen analysis.

## RESULTS

The teeth (Figures 1 and 2) and some postcranial bones clearly identified the specimen as an American mastodont (*Mammuth americanum*). A single individual was represented. The recovered inventory includes: 4 upper molars (L, R M2; L, R M3); 4 lower molars (L, R m2; L, R m3); portions of 2 tusks; small fragments of skull; portions of mandible; thyrohyoid; fragments of 8 thoracic vertebrae (including T-20); lumbar vertebrae L-1 and L-2; one caudal vertebra; portions of 7L and 12R ribs (including L #1; L, R #2; L, R #3 (or 4-6); L, R #7 (or 8-14)); 10 rib heads; portions of L humerus (proximal articulation; distal articulation, separate medial and lateral condyle fragments); R metacarpal I; R femur, with fragmentary proximal end; R patella; R fibula, distal end; L astragalus; R ectocuneiforme; L, R mesocuneiformes; L, R entocuneiformes; L metatarsal (?) IV; R metatarsal I; R metatarsal IV; R metatarsal V; 5 phalanges; and 3 sesamoids. Portions of approximately 40% of the total skeletal elements were recovered. The scapulae, pelvis, and sternbrae were scarcely represented.

Tooth wear is roughly equivalent to that of a 36 year old African elephant (wear stage XXI of Laws, 1966). Lines of epiphyseal union are obliterated on all of the recovered long bone portions, indicating full attainment of adult stature. Measurements of the teeth, femur, and thyrohyoid are presented in Table 1.

A radiocarbon date on the total organic content of the mastodont rib produced an age of  $11,160 \pm 90$  radiocarbon years B.P. (ISGS-2220). Analysis of the pollen from the tusk cavity suggests the existence of an open, spruce-dominated woodland at the time of deposition (D.R. Whitehead, pers. comm.). Pollen of fir, larch, and some hardwoods (especially ash and hornbeam) were also present. Herbs totaled 33% of the counted sample, represented primarily by sedges, composites, and grasses. The presence of algae, water milfoil, and cattails indicate open water at the site.

Other biotic remains recovered from the peat and clay piles included mollusks and bones of several smaller vertebrates. Species collected by hand included such terrestrial snails (primarily from peat) as *Anguispira alternata*, *Triodopsis multilineata*, *Triodopsis* cf. *T. vulgata*, and *Mesodon inflectus* and such aquatic snails (primarily from clayey sediments) as *Heliosoma anceps anceps*, *Gyraulus deflectus*, *Planorbella campanulata campanulata*, and *Valvata tricarinata tricarinata*. Some unidentified sphaerid clams were also found. Several minute species of aquatic snails were also abundant in the clayey soils. The smaller vertebrate skeletal remains included specimens of the following: duck, undet. small sp., L, R humeri; *Castor canadensis* (beaver), R dentary; *Sciurus niger* (fox squirrel), R femur; *Procyon lotor* (raccoon), R dentary, R tibia, R humerus; and cervidae cf. *Odocoileus virginianus* (white-tailed deer), R tibia, proximal phalange. Bones of a domestic sheep/goat and chicken were intermingled with the other bones. The duck, beaver, and deer remains had the same dark brown coloration as the mastodont bones. The other remains did not exhibit this coloration. Because of the disturbed nature of the soils any association between the mollusks, mastodont, and other vertebrates is speculative.

The mastodont remains and other materials from the locality are housed at Whitko High School, South Whitley, Indiana, under catalogue numbers LM-90-0.0 to LM-90-11.1.



Figure 1. Lewis mastodont (*Mammut americanum*), Lower R molar 3 (right lateral view). Tooth wear at death was roughly equivalent to 36 years of the modern African elephant. Scale in centimeters.



Figure 2. Lewis mastodont (*Mammut americanum*), select teeth. A. Upper RM3, crown view. B. Lower Rm3, crown view. Scale in centimeters. Note that the cusps of the upper crown align perpendicular to the long axis of the tooth, while those of the lower are oblique.

Table 1. *Mammut americanum* tooth, femur, and thyrohyoid measurements, Lewis Mastodont, Wabash County, Indiana (mm).

<b>Teeth</b>						
Placement	Length	Width	Protoloph(-id)	Metaloph(-id)	Tritoloph(id)	Tetartoloph(-id)
Upper L M3	187.5	106.5	105.4	104.0	96.5	85.4
Upper R M3	176.0	106.5	101.9	103.5	95.9	83.3
Upper L M2	122.0	93.0	87.4	90.2	93.1	
Upper R M2	121.0	89.5	86.8	91.1	91.0	
Lower L m2	122.0	98.0	83.3	94.4	95.0	
Lower R m2	117.0	98.5	80.0	93.1	93.2	
Lower L m3	188.5	106.0	99.6	106.8	103.0	95.0
Lower R m3	186.0	103.0	95.6	103.4	98.6	88.6

  

<b>Femur</b>	
Greatest length	1108.0
Greatest anteroposterior diameter of head	169.0
Least transverse diameter of shaft	157.0
Anteroposterior diameter of shaft at above position	95.0
Greatest transverse width of distal end (normal to articular surface)	283.0
Greatest width across condyles (normal to line drawn between posterior tips of condyles)	250.0
Least circumference of shaft	418.0

  

<b>Thyrohyoid</b>	
Total length	147.1

## DISCUSSION

How much of the skeleton remains buried below the construction site is unknown, but the relatively small area of sediment removed suggests that the bones lay in close proximity, if not in articulation.

The teeth are of medium size, when their measurements are compared with those from other Indiana (Graham, Holman, and Parmalee, 1983; Richards, 1984; Richards, Whitehead, and Cochran, 1988), Missouri (Saunders, 1977), and Michigan (Skeels, 1962) specimens. In particular, the third molars do not reach the great lengths displayed among the larger Michigan and Boney Springs, Missouri specimens. The femur is also of medium size, when compared to 8 other adult femora from Indiana and Missouri (Richards, 1984; Saunders, 1977).

The ratio of femur length (1.06 m) over total stature (2.78 m, height to tips of thoracic vertebrae between scapulae) of the Warren mastodont from New York (Osborn, 1936) to the length of the Lewis femur (1.108 m) indicates that the Lewis mastodont stood approximately 2.91 m (9'7") between the shoulder blades. Kurtén and Anderson (1980) note that mastodont shoulder height ranged between 2.7 and 3.0 m and that

females were smaller than males (e.g., one specimen stood 2.3 m). Perhaps, the Lewis mastodont is a male.

The disassociated mollusks indicate that the basin once harbored an abundance of aquatic snails. The absence of unionid mussels (which require a fish host for glochidia larval development; Parmalee, 1967) and presence of only sphaerid clams suggest that the waters did not maintain a fish population. The terrestrial snails appear to have inhabited the basin after infilling with peat. The smaller vertebrates, such as beaver and duck, could have visited the waters at any time during lake infilling. The mastodont was deposited at approximately 11,160 B.P. The occurrence of algae, water milfoil, and cattails in the sediments indicate that some open water was present at the time of deposition. The unusual rise in such hardwood taxa as ash and hornbeam has also been noted in other regional pollen profiles (e.g., Bailey, 1972) from about the same time period (i.e., at approximately 11,500 B.P.) and regionally seems to predate a second rise in spruce that is followed by postglacial immigration of hardwood species (D.R. Whitehead, pers. comm.).

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