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THE MANDIBLE OF AMEBELODON FRICKI

Erwin H. Barbour
The type specimen of the genus Amebelodon is installed in the Nebraska State Museum, the University of Nebraska, Lincoln. It consists of a mandible with tusks and teeth, all of which are dense and perfect, barring minor cracks and breaks. One toe bone and part of a rib found associated with this mandible may belong to this animal. It was discovered by Mr. A. S. Keith on his farm near Freedom, Frontier County, Nebraska; was secured for the palaeontological collections of Hon. Charles H. Morrill by Mr. Phillip Orr, April 4, 1927; was briefly described and figured in a Museum bulletin June, 1927. After a long but unavoidable delay, this mandible has just been mounted and the first photographs with correct measurements are now possible and are presented herewith. Preliminary drawings and measurements were made while the specimen was still in its plaster cinches. This unique specimen, representing a new group of longirostral mastodonts, has been named Amebelodon fricki, and the group designated the Amebelodonts, or shovel-tuskers. Amebelodonts are such distinctive elephants that they plainly belong in a group by themselves, namely the sub-family Amebelodontinae. In them is realized the culmination, in the late Pliocene or early Pleistocene, of the flattened tusks and lengthened mandible of Phiomia osborni of the Egyptian Oligocene.

Phiomia osborni gave rise to a varied but slowly declining race of long-jawed mastodons including Seridentinus, Dibelodon, Trilophodon, Tetralophodon, and Amebelodon, while Moeritherium and Palaeomastodon led to an expanding race of proboscidians such as the European and American Mastodon, Stegodon, Archidiskodon, Parelephas, the true mammoth, and the living Indian and African elephants. Amebelodon may have been among the latest and most specialized of the longirostral mastodonts, if his mandible and tusks are criteria, and may have been contemporaneous with the American mastodon and the mammoth. In massiveness and length, this mandible passes that of all proboscidians known.

1 Preliminary notice of a new Proboscidean, Amebelodon fricki gen. et. sp. nov., Bulletin 13, Volume I, June 1927, the Nebraska State Museum.
Fig. 93. The mandible of *Amebelodon fricki*, the shovel-tusked mastodon, showing the great shovel-tusks and symphysial trough, in comparison with a full-grown man. Specimen No. 4-4-27, the collections of Hon. Charles H. Morrill, the Nebraska State Museum, The University of Nebraska, Lincoln. Prepared by Philip Orr, Henry Reider, and Miss Carrie A. Barbour.
Fig. 94. a. The mandible of Amebelodon fricki from above. In life the tusks met on the median line. They are thrown apart apparently by a sun crack in the bone.
b. Same from below, showing a large sun crack.
as yet, and stands, in fact, as the largest jaw of any recorded land mammal. It is further characterized by two broadened, shovel-like, mandibular tusks and a great symphysial trough. The tips of the tusks are worn in such a way as to suggest their possible adaptation to digging, hence the name Amebelodon. The shovel-like tusks may have been used to uproot and dislodge aquatic plants in river bottoms, swamps, marshes, and bayous. By sweeping the jaw through the water, certain fresh-water algae and other aquatic plants could be caught and by lifting the head many could flow down the great symphysial trough to the mouth or could be pushed along by the proboscis. Possibly the shovel-tuskers dug in loose sand for roots, tubers, and bulbs, but it is inconceivable that they could have dug in firm and dry ground because the leverage was too great, and the walls of the jaw seem too thin, especially at the point of greatest strain, at which spot the alveolar spaces are unduly large. Of course the tensile strength of bone is high. The alveoli when cast are about as large as, and very like, human cerebral hemispheres, each being 6\(\frac{1}{2}\) inches (165 mm.) deep by 5\(\frac{1}{2}\) inches (140 mm.) broad. At this spot the walls of the mandible are reduced in places to but one-half an inch in thickness. In heavy digging, if they dug at all, perhaps the trunk was wound around the jaw to lend it muscular reinforcement. It is not unlikely that this over-developed organ never really functioned as a shovel. To ascribe to the amebelodonts any aquatic adaptations, or any tendencies to shovel may be over-fanciful, but the association of ideas results naturally from the shovel-shape of the inferior tusks. It is quite as reasonable to assume that amebelodonts were lovers of forest, underbrush, and firm ground, and that the unique shovel-shaped jaw was but an excessive development that did not materially affect the life habits of this race. Finding themselves possessed of such a shovel, the creatures might have learned to put it to use as such, or they might have turned this abnormal jaw to good account in collecting herbage by pressing the coarse and calloused trunk against the tusks and the edges of the jaw, and thereby stripping off leaves, twigs, and heads of grain by a swing of the head.

The mandibular tusks of Amebelodon are huge in comparison with those of other tetrabelodons, the length being 45 inches (1144 mm.), and the width 5\(\frac{1}{2}\) inches (140 mm.). The pulp cavities of the tusks seem to have been unduly short, but 14 inches (356 mm.), tapering abruptly. At the base of each, the inner and the outer borders are so folded together
Fig. 95. Right lower molar of Amebelodon fricki, crown view showing five grinding ridges, with trefoiled patterns. Length 9 inches (229 mm.); width 3½ inches (88 mm.). Very low-crowned.

Fig. 96. A charcoal sketch showing a conjectural restoration of the head of Amebelodon fricki. Total length of the mandible, 6 feet, 6¾ inches. Total length from the base of the skull to the tips of the mandibular tusks estimated to have been between 7 and 8 feet.
as to make a deep groove, which is occupied by a pendant strip of bone about a foot long, three inches deep, and a half inch thick. Amebelodont tusks are so immoderately developed that they are very unlike those of other four-tuskers, of which average mandibular tusks are about one inch to an inch and three-fourths wide, and fifteen to eighteen inches long. The mandible of Megabelodon lulli when discovered was conceded to be the longest proboscidean jaw recorded, but in comparison, Amebelodon fricki is longer and more massive, except that the ascending rami of Amebelodon are actually not as large and massive as those of Megabelodon. Since the discovery and announcement of Amebelodon fricki, three other distinct species, found in Nebraska, have been added to the proboscidean collections of the State Museum and are now photographed and the descriptions ready for publication.

In the case of one of these, fortunately, the lower and the upper dentition is known, as well as most of the skeleton, the first recorded. From the material already at hand it is plain that there are two very distinct types of amebelodonts, namely one group with straight, long tusks and straight jaws, another group with relatively short, curved tusks and curved jaws, which group we have already designated the dredgetuskers, to be described in forthcoming papers. It seems a safe prediction that the next few years cannot fail to reveal a rich, interesting, and varied amebelodont fauna.

In the field season of 1930 the quarry will be reopened and carefully explored in an attempt to recover other relics of Amebelodon fricki.

It should be recorded that in the month of November last, twenty proboscideans, including tetrabelodons, mastodons, and mammoths, were located in Nebraska. Some at least of these will be secured in the field season of 1930. It is doubtful if any like area boasts of like numbers, for wherever ground is broken in Nebraska, the sand hills excepted, proboscidean bones may be expected. It may be interjected that the short grass of the treeless Great Plains would not sustain such hords of proboscideans, but the presumption is that the Great Plains were not always treeless, as is evidenced by widely distributed fossil woods and nuts. Perhaps such unnumbered herds aided in the destruction of forest and underbrush, thus reducing their own food supply and decimating their numbers.

At this writing no reports on any of the Amebelodontinae have reached this office and no citations can be offered.
Fig. 97. A pencil sketch showing a conjectural restoration of Amebelodon fricki in its supposed habitat feeding upon aquatic plants. In their life habits they may have been like other longirostral mastodons, the jaw and tusks being simply extreme developments.
AMEBELODON PUBLICATIONS

Barbour, Erwin H.

Preliminary notice of a new Proboscidean, Amebelodon fricki gen. et. sp. nov. Bulletin 13, Volume 1, June, 1927, the Nebraska State Museum.

The mandibular tusks of Amebelodon fricki. Bulletin 14, Volume 1, December, 1929, the Nebraska State Museum.

The mandible of Amebelodon fricki. Bulletin 15, Volume 1, December, 1929, the Nebraska State Museum. The present bulletin.

MEASUREMENTS

Fig. 93.
Depth of mandible at the tip, 6½ inches (165 mm.).
Depth in front of molar, 8⅞ inches (222 mm.).
Depth back of molar, 7 inches (178 mm.).
Depth at coronoid, 14 inches (356 mm.).
Width of ascending ramus, 10⅞ inches (274 mm.).
Molar, 9 inches (229 mm.) long, by 3⅞ inches (89 mm.) wide, by 1 inch (25 mm.) high at the front ridge to 1¼ inches (32 mm.) at the heel.

Fig. 94 a.
Total length of mandible, 6 feet 5⅞ inches (1970 mm., approximately 2 meters).
Length of mandible alone, 4 feet 10 inches (1475 mm.).
Distance across condyle 20 inches (508 mm.).
Distance across coronoids, 18 inches (457 mm.).
Transverse diameter of condyle 5⅓ inches (140 mm.).
Greatest thickness of ramus, 5⅜ inches (147 mm.).

Fig. 94 b.
Width of tusks, 5⅛ inches (140 mm.).
Greatest width of jaw, 10⅜ inches (263 mm.).
Width at narrowest point, 7¾ inches (197 mm.).

Fig. 95.
Molar: Length, 9 inches (229 mm.); width, 3⅞ inches (89 mm.).

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