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## THE NEBRASKA STATE MUSEUM

ERWIN H. BARBOUR, *Director*

## THE MANDIBLE OF AMEBELODON FRICKI

BY 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.<sup>1</sup> 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 mastodonts including *Seridentinus*, *Dibelodon*, *Trilophodon*, *Tetralophodon*, and *Amebelodon*. While *Moeritherium* and *Palaeomastodon* led to an expanding race of proboscideans 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 proboscideans known

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



Fig. 93. The mandible of *Amebelodon fricki*, the shovel-tusked mastodon, showing the great shovel-tusks and symphyseal 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.

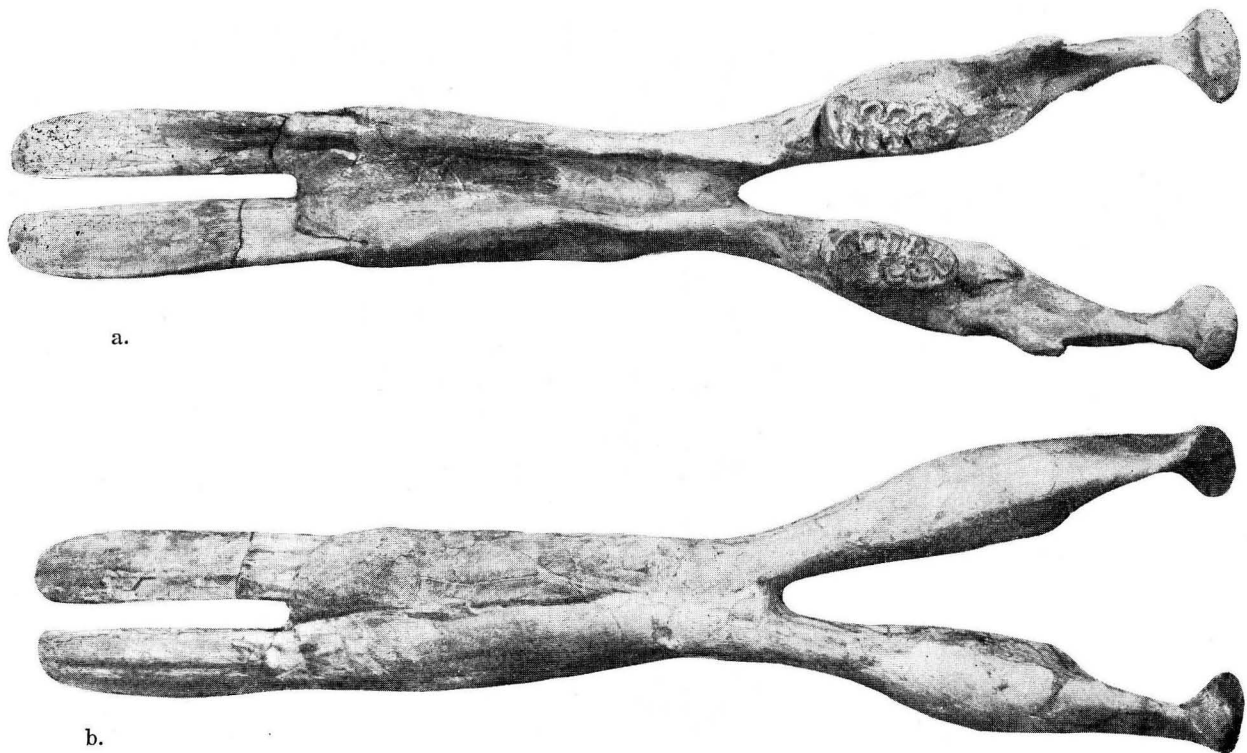


Fig. 94. a. The mandible of *Amebelodon fricki* from above. In life the tusks met on the median line. They are thrown apart apparently by a sun crack in the bone.  
b. Same from below, showing a large sun crack.

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 symphyseal 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 symphyseal 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 tetrabelodonts, 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

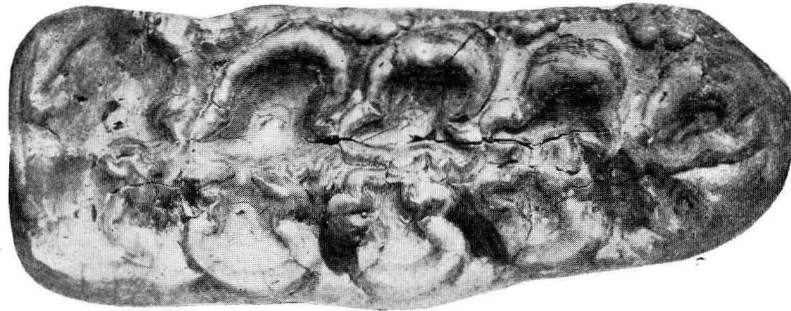


Fig. 95. Right lower molar of *Amebelodon fricki*, crown view showing five grinding ridges, with trefoiled patterns. Length 9 inches (229 mm.); width  $3\frac{1}{2}$  inches (88 mm.). Very low-crowned.

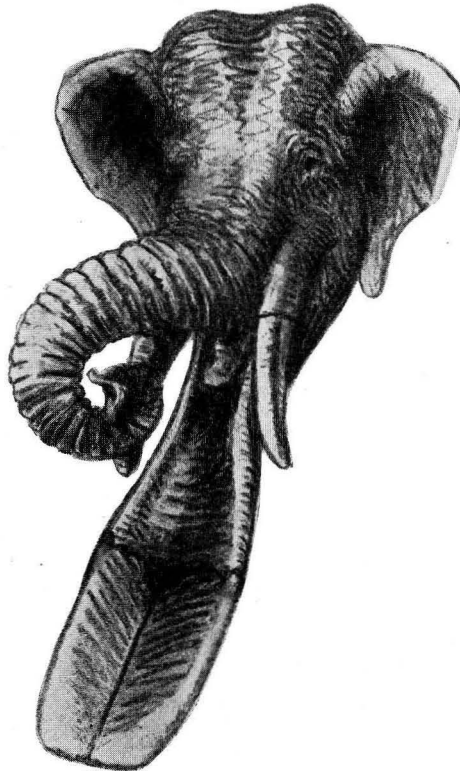


Fig. 96. A charcoal sketch showing a conjectural restoration of the head of *Amebelodon fricki*. Total length of the mandible, 6 feet,  $5\frac{1}{2}$  inches. Total length from the base of the skull to the tips of the mandibular tusks estimated to have been between 7 and 8 feet.

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 dredge-tuskers, 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.

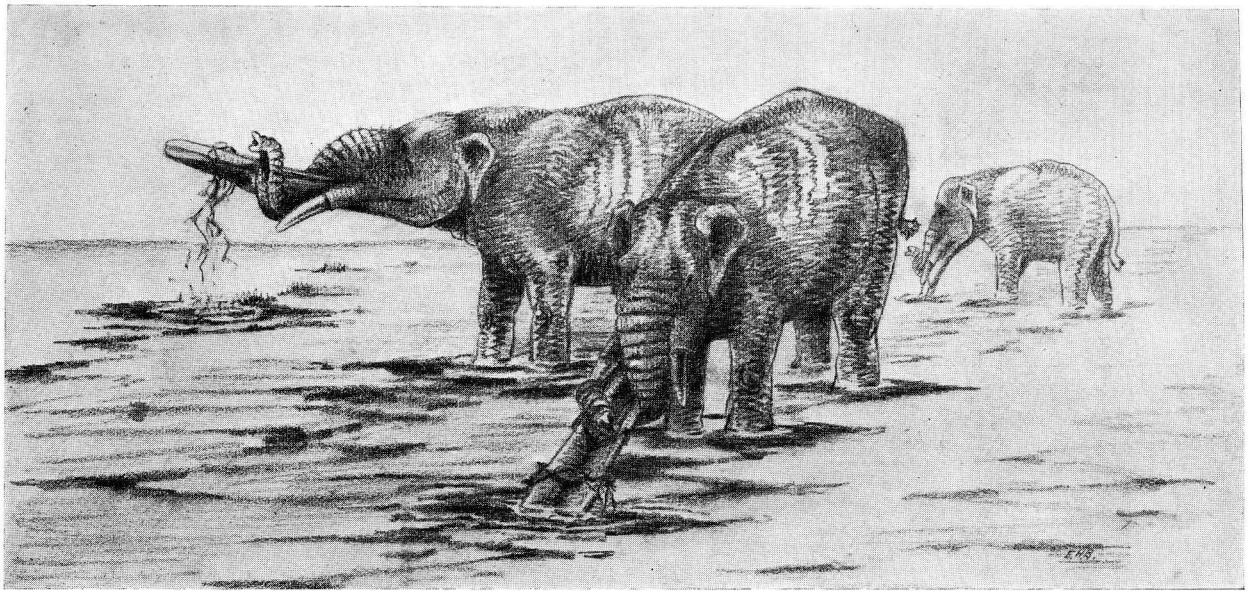


Fig. 97. A pencil sketch showing a conjectural restoration of *Amebelodon fricki* in its supposed habitat feeding upon aquatic plants. In their life habits they may have been like other longirostral mastodons, the jaw and tusks being simply extreme developments.



## AMEBELODONT 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,  $6\frac{1}{2}$  inches (165 mm.).

Depth in front of molar,  $8\frac{3}{4}$  inches (222 mm.).

Depth back of molar, 7 inches (178 mm.).

Depth at coronoid, 14 inches (356 mm.).

Width of ascending ramus,  $10\frac{3}{4}$  inches (274 mm.).

Molar, 9 inches (229 mm.) long, by  $3\frac{1}{2}$  inches (89 mm.) wide, by 1 inch (25 mm.) high at the front ridge to  $1\frac{1}{4}$  inches (32 mm.) at the heel.

Fig. 94 a.

Total length of mandible, 6 feet  $5\frac{1}{2}$  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  $5\frac{1}{2}$  inches (140 mm.).

Greatest thickness of ramus,  $5\frac{3}{4}$  inches (147 mm.).

Fig. 94 b.

Width of tusks,  $5\frac{1}{2}$  inches (140 mm.).

Greatest width of jaw,  $10\frac{1}{2}$  inches (268 mm.).

Width at narrowest point,  $7\frac{3}{4}$  inches (197 mm.).

Fig. 95.

Molar: Length, 9 inches (229 mm.); width,  $3\frac{1}{2}$  inches (89 mm.).