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ADDITIONAL GENERIC AND SPECIFIC STAGES IN THE EVOLUTION OF THE PROBOSCIDEA¹

BY HENRY FAIRFIELD OSBORN

In three immediately preceding papers the author has added a number of new generic and specific names to the Proboscidea, to which he would now like to add the following from observations up to the close of the year 1924.

MORRILLIA, new subgenus

Named in honor of the Honorable Charles H. Morrill of Nebraska, in recognition of his generous support of the field expeditions and collections made under the direction of Professor Erwin H. Barbour, which have yielded such astonishing results, especially in the subfamily Longirostrinæ, including the *Trilophodon* and the *Tetralophodon* of Nebraska.

The type species of this subgenus, *Tetralophodon barbouri*, is from the Upper Pliocene of Nebraska (Neb. Mus. 4-22-6-16). The third left inferior molar on which this species is based differs profoundly from the corresponding molar on which Kaup founded his species *Mastodon longirostris*, 1832, 1835, which in turn became the genotypic species of *Tetralophodon* Falconer, 1847, 1857. The chief contrasts between these two subgenera are the following:

Subgenus <i>Tetralophodon</i> , sens. stric.	Subgenus <i>Morrillia</i>
Type species: <i>Mastodon longirostris</i> Kaup	Type species: <i>Tetralophodon barbouri</i> Osborn
Brachyodont.	Extremely hypsodont.
Five and a half ridge-crests.	Seven and a half ridge-crests.
Valleys open; no cement.	Valleys closed; thick cement.
Double trefoils, feebly developed.	Double trefoils, strongly developed.

The accompanying figure clearly shows the profound difference between these two stages, both of which undoubtedly belong in the subfamily Longirostrinæ, generic phylum *Tetralophodon*.

¹This is the author's fifteenth communication on the evolution and classification of the Proboscidea since 1918, and the twenty-fifth in his total list of papers on the Proboscidea since 1907.

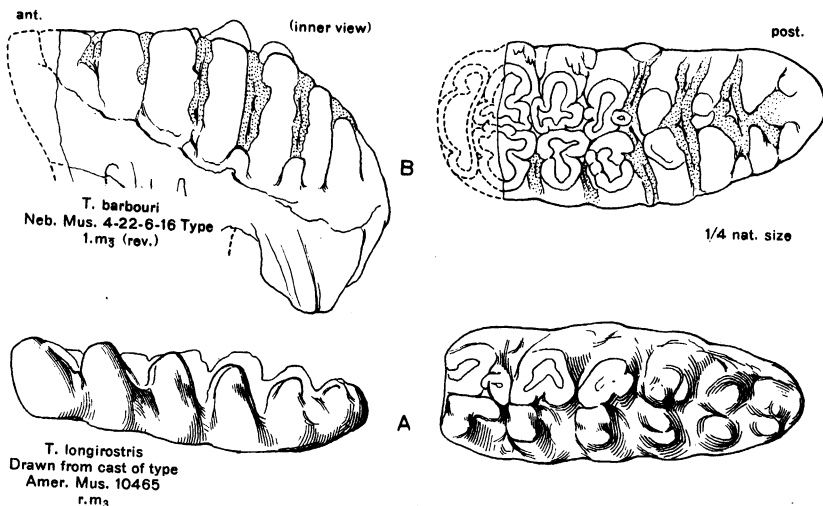


Fig. 1. Type species of *Tetralophodon* (lower) and of *Morrillia* (upper), reduced to the same scale, namely, one-fourth natural size.

B, Third lower molar, M_3 , of *Tetralophodon* (*Morrillia*) *barbouri*.

A, Third lower molar, M_3 , of *Tetralophodon longirostris*.

LYDEKKERIA, new subgenus

This new subgenus, named in honor of Richard Lydekker, the British zoologist and palaeontologist, is based upon the species *Mastodon* (*Trilophodon*) *falconeri* Lydekker, 1877, from the Lower Chinji horizon, Siwaliks, India, which is correlated with the Middle Miocene stage of Saint Gaudens, France. This species belongs in the *Tetralophodon* phylum and is in possession of three and a half to four crested intermediate molars, whereas in *Trilophodon* the intermediate molars are three-crested. The generic distinctions from the true *Tetralophodon* stage are as follows: (1) second upper and lower molars subtetralophodont to tetralophodont; (2) molars with single central trefoils instead of double trefoils; (3) third upper and lower molars apparently with four and a half to five crests instead of five and a half to six crests; (4) molars extremely short-crowned or brachyodont; (5) jaws of medium length, i.e., medi-longirostral.

Besides the type species of this subgenus, other subtetralophodonts from the Miocene of Europe, India, and southern Asia appear to be in a similar stage of evolution, for example, *Mastodon grandincisivus* Schlesinger. *Mastodon perimensis* var. *sinensis* Koken, from Yunnan, China, appears to be in a Miocene stage of evolution very similar to that of

Mastodon (Trilophodon) falconeri. When these Miocene tetralophodonts become more fully known, it would appear that the subgenus *Lydekkeria* will be established as a genus by other characters less progressive than those which distinguish *Tetralophodon*.

***Stegomastodon texanus*, new species**

TYPE.—Amer. Mus. 10622. An aged female skull and jaws with inferior and superior third molars, M₃³.

PARATYPE.—Amer. Mus. 10623. Less aged adult jaw.

LOCALITY.—Blanco formation of Texas, Llano Estacado.

HORIZON.—Upper Pliocene.

This skull was originally referred by Gidley and Osborn to the species *Mastodon mirificus* of Leidy, but it is found to belong to a distinct and much more progressive stage, of which a number of ascending mutations occur in the Blanco horizon, as observed by J. W. Gidley and W. D. Matthew. The grinders of *Stegomastodon texanus* are much more hypsodont and much more ptychodont, or chcerodont, than those of the type of *M. mirificus*. Whereas both *Stegomastodon (Mastodon) mirificus* and *S. (Mastodon) successor* have five and a half perfect ridge-crests and a two-coned sixth crest, the type and paratype of *S. texanus* have six and a half ridge-crests, that is, they are fully hexalophodont, and thus are much more progressive. We observe that in *S. texanus* the tetartoloph, pentaloph, and hexaloph have highly ptychoid enamel crests; the heptaloph consists of three cones, the octaloph of two low conelets.

***Stegomastodon aftoniae*, new species**

TYPE.—A third right superior molar, r.M³ (Univ. Iowa Coll. 213, cast Amer. Mus. 2573), and a left superior molar, l.M³ (Univ. Iowa Coll. 212).

LOCALITY.—About two miles east of Akron, Plymouth County, Iowa, section 33, township 93 north, range 48 west, twenty feet below the surface.

HORIZON.—Lower Pleistocene, Aftonian of Iowa, *vide* Calvin, Shimek, and Hay.

Calvin originally figured one of these specimens under Leidy's name *Mastodon mirificus*; they were subsequently described by Hay (1914), the latter referring the types to *Rhabdobunus mirificus*, a new genus which he created and which is anticipated by *Stegomastodon* Pohlig. *Stegomastodon aftoniae*, however, proves to be far more progressive than *S. mirificus*, as shown in the following comparison made by Osborn.

- 1.—*Mastodon mirificus*, Leidy's type of Nebraska, six ridge-crests plus a very rudimentary talon; double cones and incipient double trefoils on proto-, meta-, tritolophids.

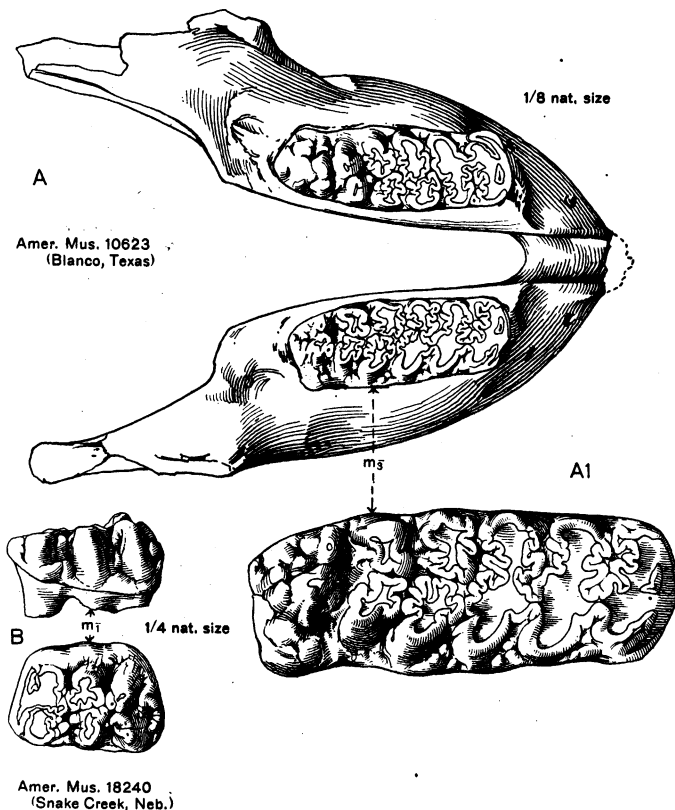


Fig. 2. Paratype of *Stegomastodon texanus* and type of *Stegomastodon nebrascensis*.

A, A1, Paratype of *Stegomastodon texanus* (Amer. Mus. 10623), Blanco, Texas. Upper Pliocene.

B, Type of *Stegomastodon nebrascensis* (Amer. Mus. 18240), Snake Creek, Nebraska. Middle Pliocene.

2.—*Stegomastodon arizonæ*, Gidley's type of Curtis Flats, Arizona, M_3 , seven and a half ridge-crests.

3.—*Stegomastodon aftonianæ*, Osborn's type of Iowa, M_3^3 , seven ridge-crests plus well-developed talon; highly labyrinthodont double trefoils on proto-, meta-, trito-, tetarto-, and ?pentalophs; hexaloph, two simple, widely separated cones; heptaloph, two rudimentary cones closely conjoined. Since the inferior molars of *Stegomastodon* are much more progressive than the superior molars, we should expect to find M_3 in the Aftonian stage with nearly eight ridge-crests.

Osborn agrees with Calvin, Shimek, and Hay that the type is probably of Aftonian (First Interglacial) age and considers *S. aftonianæ* as

geologically much more recent than Leidy's type of *M. mirificus*, which proves to be of Upper Pliocene age as compared with the much more progressive *S. texanus* above described.

***Stegomastodon nebrascensis*, new species**

TYPE.—Amer. Mus. 18240. A right inferior molar, r.M₁.

LOCALITY.—Snake Creek, Sioux County, western Nebraska.

HORIZON.—Middle Pliocene. Snake Creek horizon.

The type is apparently a first inferior molar of the right side and was collected in the river drift of the Snake Creek horizon. It exhibits the following characters: (1) cones closely compressed; (2) double external and internal trefoils; (3) broad crenulate external cingulum; (4) internal conelets arising from the internal cingulum in the internal and median valleys; (5) measurements as in figure 2 B.

These characters denote a very primitive stage in the *Stegomastodon* phylum, somewhat more primitive, it appears, than Leidy's type of *Stegomastodon mirificus*. In the accompanying figure comparison is afforded with another stegomastodont, namely:

A, A1, *Stegomastodon texanus* paratype (Amer. Mus. 10623); B, *Stegomastodon nebrascensis* type (Amer. Mus. 18240).

This type specimen appears to establish the migration into America of the brevirostrine mastodonts in Middle Pliocene time. They sojourned here until the Aftonian stage of early Pleistocene time, meanwhile undergoing a rapid progressive evolution from the primitive *S. nebrascensis* stage to the very progressive *S. aftoniæ* stage.

