

AMERICAN MUSEUM NOVITATES

Number 238

Published by
THE AMERICAN MUSEUM OF NATURAL HISTORY
New York City

Nov. 30, 1926

56.9,61

ADDITIONAL NEW GENERA AND SPECIES OF THE MASTODONTOID PROBOSCIDEA¹

BY HENRY FAIRFIELD OSBORN

Partly by discovery of new material and partly by more intense analysis of old material, as arranged in inverted phylogenetic order, a number of new genera and species of extinct proboscideans will now be distinguished. The reader is referred to previous systematic revisions by the present author in the appended bibliography, also to his forthcoming Memoir on "The Evolution of the Proboscidea" now on the American Museum press.

PLIOMASTODON, new genus

Genotypic species: *Mastodon* (*Miomastodon*) *matthewi* Osborn, of Middle or Upper Pliocene age.

The chief character of this genus is the *absence* of lateral enamel bands on the superior incisive tusks, in contrast to the Middle Miocene *Miomastodon* Osborn, in which the lateral enamel bands are present.

The genotypic species *Mastodon* (*Miomastodon*) *matthewi* occurs in the Snake Creek B formation of western Nebraska associated with the types of *Serridentinus anguivalis*, new species, *Rhynchotherium anguivalis*, new species, and *Stegomastodon nebrascensis*.

***Mastodon americanus plicatus*, new subspecies**

TYPE.—Amer. Mus. 10666. Superior true molar series of the right side, r. M¹⁻³.

LOCALITY.—Walnut, Illinois.

HORIZON.—Geologic age uncertain, possibly of Postglacial (IV) or post-Wisconsin age.

SPECIFIC CHARACTERS.—This progressive subspecies is distinguished by numerous minor foldings, valleys, and plications which break up all the surfaces of the lophs or lobes and which to a certain degree indent even the summits of the ridge-crests.

As in the case of the type of *Mastodon rugosidens* Leidy, it is somewhat doubtful whether these foldings and plications represent constant specific characters. Consequently the teeth are given merely subspecific rank, pending a fuller study of the dental characters in the *Mastodon americanus* molar teeth in America.

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

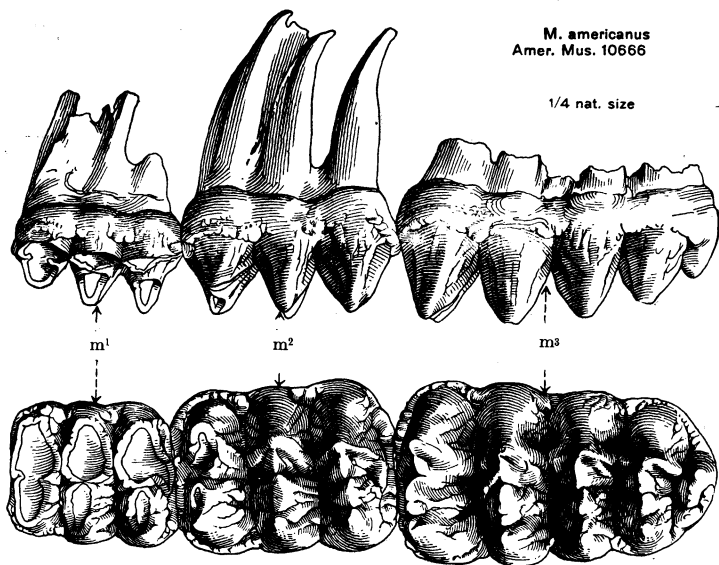


Fig. 1. Type superior true molar series of *Mastodon americanus plicatus*, new subspecies (Amer. Mus. 10666). One-fourth natural size.

***Zygolophodon pyrenaicus aurelianensis*, new subspecies**

This Lower Miocene stage may become known as *Zygolophodon pyrenaicus aurelianensis*, since the abundant remains listed by Mayet (1908, pp. 198, 199) below are undoubtedly distinct specifically or subspecifically from the Middle Miocene *Zygolophodon pyrenaicus* of Lartet.

COTYPES.—Superior tusks and superior and inferior molars designated by Mayet as follows (Mayet, 1908, pp. 198, 199): “Un fragment de défense supérieure (Chevilly, sablière Cassegrain, collection Nouel) est de coupe sensiblement ovale, sans la moindre trace de bande longitudinale d’émail; . . . Une M_3 supérieure gauche (Avaray, musée d’Orléans) déterminée par M. Lartet lui-même, est à couronne très large, supportant quatre collines dont les deux premières ont leurs vallons partiellement interceptés par un tubercule accessoire; les deux collines postérieures, plus comprimées, presque tapiroïdes, sont séparées par des vallons libres; le talon postérieur est en forme de crête crénelée; . . . Une M_2 supérieure droite du musée d’Orléans, . . . provenant de Beaugency et déterminée par M. Lartet; . . . Une M_2 inférieure (musée d’Orléans, sans localité indiquée) est à trois collines, avec, en arrière, un assez fort talon tuberculé.”

LOCALITY.—Sables de l’Orléanais, Chevilly (?), Cassegrain, Avaray, France.

HORIZON.—Lower Miocene.

SPECIFIC CHARACTERS.—Four conelets in each loph, intermediate tubercles in the valleys. The superior incisors are of oval section and lack all traces of the longitudinal enamel band.

TURICIUS, new genus

The new generic name *Turicius* is derived from Turicum, the Latin name of Zurich, near which city the genotypic species *Mastodon turicensis* Schinz, 1824, was discovered.

The grounds on which this genus is separated from *Zygolophodon* Vacok, 1877, are briefly as follows:

GENERIC CHARACTERS.—Transverse crests, lophs, with five conelets progressing to eight or nine conelets. Tubercles or conules retrogressive in the valleys between the crests. Median longitudinal sulcus vestigial in the early stages, completely disappearing in the progressive stages. Progressively strong 'trefoil spurs' on the superior internal cones and on the inferior external cones. Conelets increasingly connate at the summit, rising into sharp, subhypsodont transverse crests. Superior incisors oval in section, with sharply defined enamel band except in *Mastodon* [= *Turicius*] *virgatidens*. Inferior incisors without enamel, straight, suboval in section, undergoing progressive reduction. Symphysis of jaw progressively pointed and reduced in length, horizontal, unlike *Serridentinus*, in which the jaw remains elongate. Postero-inferior molars with four well-developed crests, the tetartolophid slowly progressive, the pentalophid rudimentary, but progressive in the higher stages. Gradual repression of the premolar dental succession, as in *Mastodon americanus* and in *Zygolophodon borsoni*.

In contrast the generic characters of *Zygolophodon* are as follows:

GENERIC CHARACTERS.—Each loph divided into four to five distinct subequal conelets. No trace of median longitudinal sulcus. Conules or tubercles in median valleys disappearing in progressive stages. Crests, i.e., lophs, directly transverse, not arched. No 'trefoil spurs' arising from external or internal cones. Fifth inferior crest, i.e., pentalophid, slowly progressive. Superior incisive tusks rounded, without enamel band (*Z. borsoni*). Grinders permanently blunt, brachyodont (*Z. borsoni*), not becoming subhypsodont. Progressive adaptations similar to those of *Mastodon americanus* rather than to those of *Turicius*.

Turicius turicensis simorreensis, new subspecies

TYPE.—A third right inferior molar, r.M₃.

LOCALITY.—From near Simorre (Gers), France.

HORIZON.—Upper Middle Miocene.

TYPE FIGURE.—After Lartet, 1859, Pl. xv, fig. 3, erroneously referred by him to *Mastodon tapiroides*.

SPECIFIC CHARACTERS.—Strong external trefoil crest; strong internal cingulum; tetartolophid well developed with four conelets; pentalophid rudimentary with two conelets. A premolar succession (Lartet). Anteroposterior measurement 205 mm., transverse measurement 83 mm.

The type molar (Fig. 2) was originally figured by Lartet (1859, Pl. xv, fig. 3) in his paper entitled "Sur la dentition des proboscidiens

fossiles (*Dinotherium*, *Mastodontes* et *Éléphants*) et sur la distribution géographique et stratigraphique de leurs débris en Europe." He erroneously referred it, however, to *Mastodon tapiroides*. The present author now chooses it as the type of the subspecies *Turicius turicensis simorrensis*, in reference to the locality in which it was found.



Fig. 2. Type third right inferior molar, r.M₃, of *Turicius turicensis simorrensis*, new subspecies. After Lartet, 1859, Pl. xv, fig. 3, one-half natural size.

***Serridentinus browni*, new species**

To the genus *Serridentinus* Osborn, 1923, now known to be entirely distinct from the genus *Trilophodon* Falconer, several species from Europe, Asia, and North America are referable. To these it is very important to add the following stage, *Serridentinus browni*, from the Lower Siwaliks of India, named in honor of Mr. Barnum Brown.

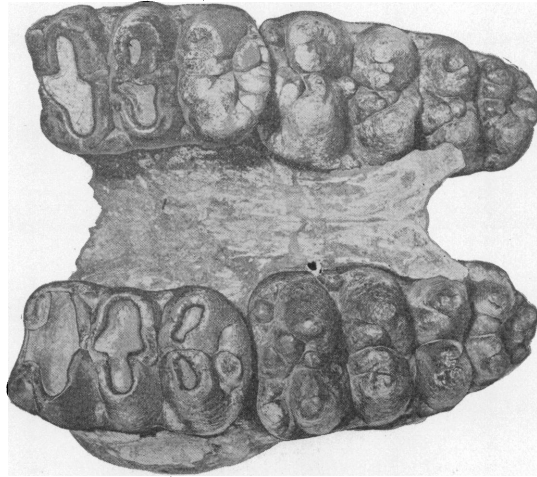
TYPE.—Amer. Mus. 19417. Posterior portion of maxilla containing the second and third superior molars of both sides, M²⁻³, with unattached tusk, also lower jaws with first and second molars of both sides, M₁₋₂, together with both tusks.

HORIZON AND LOCALITY.—Collected by Barnum Brown in 1922, from near the Chinji Bungalow, Lower Chinji horizon, Lower Siwaliks, India, of Middle Miocene age. This horizon also yielded the types of *Dinotherium pentapotamix* and *Tetralophodon* (*Lydekkeria*) *falconeri*, as well as *Dinotherium indicum* ref. and *Trilophodon angustidens* var. *chinjiensis* (name only). The Lower Chinji horizon is regarded as of the same geologic age as the Middle Miocene Sansan and Simorre in France containing the typical *Trilophodon angustidens*.



Fig. 3. Type jaw of *Serridentinus browni*, new species (Amer. Mus. 19417), with M_{1-2} of both sides (left M_2 broken). From the Lower Chinji horizon, India. One-fourth natural size. Teeth correct; symphysis distorted.

SPECIFIC CHARACTERS.—Molar crowns low, brachyodont; cones obtuse. M^2 with rudimentary tetartoloph; M^3 with rudimentary pentaloph. Lower incisors abbreviated, procumbent, suboval.



r. m²·3 inner view
A.M.19417 Type

slightly oblique

S. BROWNI

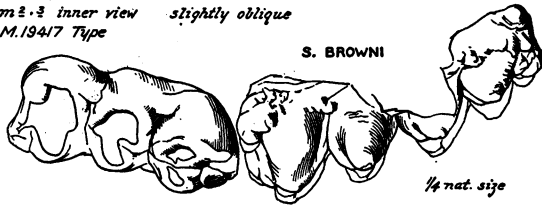


Fig. 4. Type of *Serridentinus browni*, new species (Amer. Mus. 19417). One-fourth natural size.

Palate and oblique internal crown view of superior molars.

***Serridentinus republicanus*, new species**

To the genus *Serridentinus* should also be added a new Lower Pliocene stage from the Republican River formation, northwestern Kansas, previously considered by the present writer as belonging to *Tetralophodon campester* Cope.

TYPE.—Amer. Mus. 8536. A nearly perfect left mandible containing M_{1-3} .

PARATYPE.—Amer. Mus. 8530. Portion of a right mandible with M_2 *in situ*.

TYPE AND PARATYPE HORIZON AND LOCALITY.—Republican River formation, Lower Pliocene, northwestern Kansas.

TYPE AND PARATYPE CHARACTERS.—Superior incisors elongate, laterally compressed, with very broad enamel band. First inferior molars functioning until third molars come into place. Second inferior molars with three pairs of rounded prominent internal-external cones and two prominent tetartolophid cones (compare *S. serridens*). Third inferior molars elongate with four prominent internal-external cones, proto-, meta-, trito-, and tetartolophid; the tetartolophid is much inferior in height (elev. 55 mm.) as compared with the metalophid (elev. 87 mm.). Three to five low posterior conelets, representing the pentalophid. Cones and conelets of the rounded,

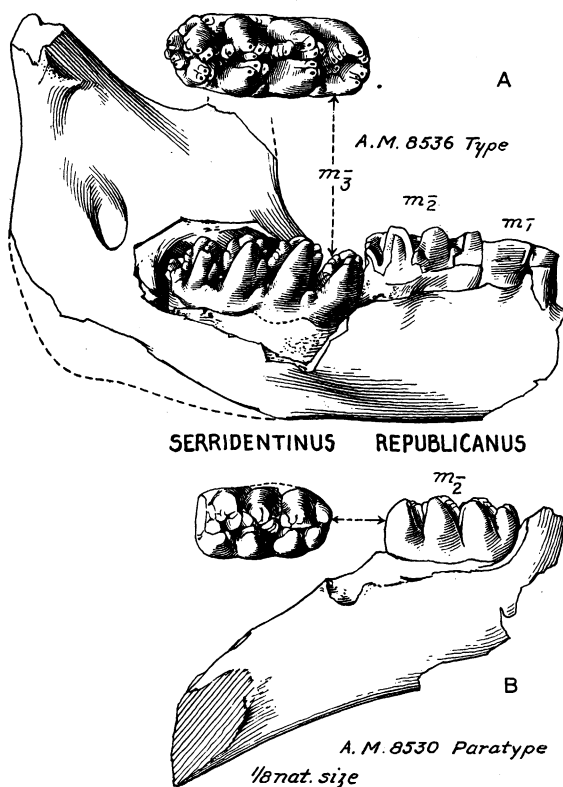


Fig. 5. Type and paratype of *Serridentinus republicanus*, new species, one-eighth natural size.

A, Type mandible (Amer. Mus. 8536); internal and crown views of l. M_1 .

B, Paratype mandible (Amer. Mus. 8530); internal and crown views of r. M_2 .

non-compressed form of *S. productus* and of *S. floridanus*, rather than of the elevated, compressed form of *S. serridens*. Highly characteristic multiple conelets rising on the external trefoil spurs, with from three to four conelets clustered at the sides and summits, thus exceeding any other florescent trefoil spurs and conelets in the Serridentinæ. Intermediate columnar conelets rising on anterior faces of internal cones of tritolophid and tetartolophid.

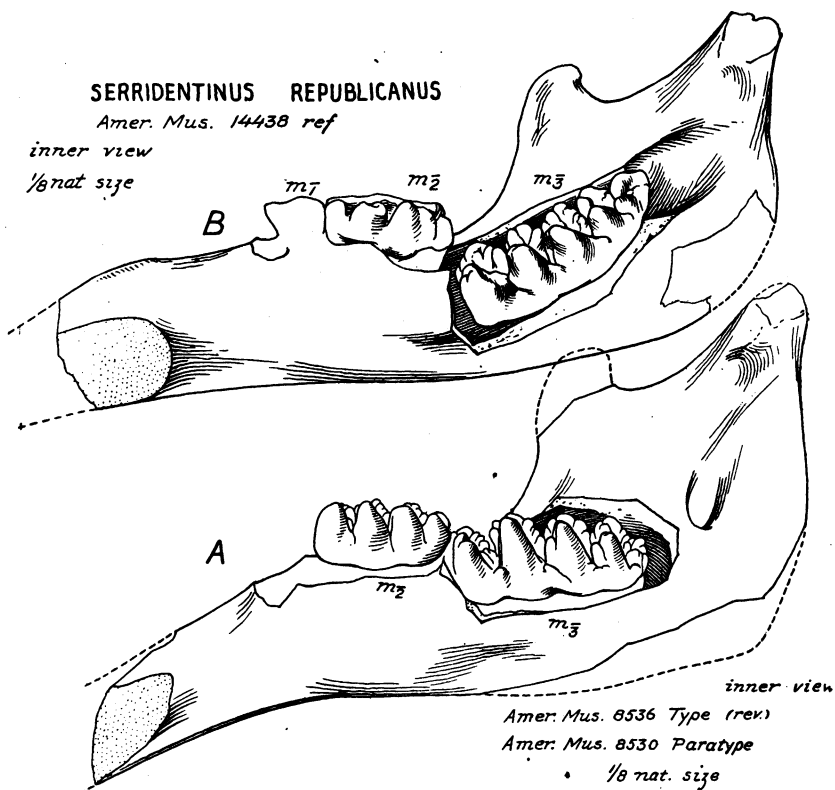


Fig. 6. Combined type and paratype jaws of *Serridentinus republicanus*, new species, also referred jaw, one-eighth natural size.

A, Inner view of type jaw (Amer. Mus. 8536) with l.M₃ in situ (reversed), combined with anterior end of paratype jaw (Amer. Mus. 8530) showing r.M₂.

B, Inner view of referred jaw (Amer. Mus. 14438) with M₁₋₃ in situ.

Serridentinus obliquidens, new species

One of the last survivors of the *Serridentinus* phylum was found in the Pleistocene phosphate beds near Charleston, South Carolina.

TYPE.—Amer. Mus. 13710. A left inferior molar, $1.M_3$, from the Cohen collection presented to the American Museum in 1908 by Mrs. Morris K. Jesup.

PARATYPE.—Amer. Mus. 13710a. A left superior molar, $1.M^3$, also from the Cohen collection.

TYPE AND PARATYPE HORIZON AND LOCALITY.—Pleistocene phosphate beds near Charleston, South Carolina.

SPECIFIC CHARACTERS.—The broken left inferior molar type consists of the posterior half of the metalophid and the succeeding third, fourth, fifth, and rudimentary

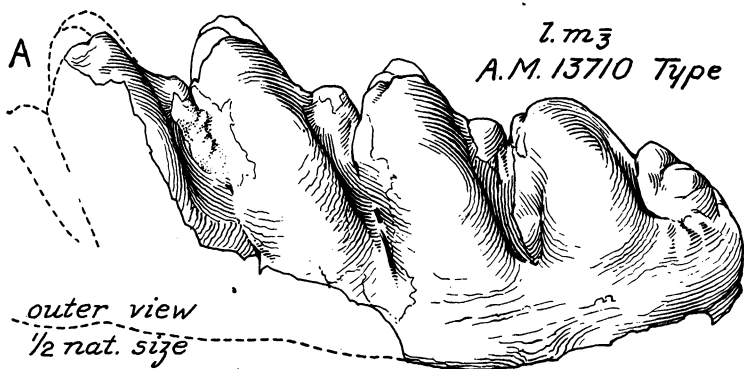
S. OBLIQUIDENS

Fig. 7. Type left inferior molar, $1.M_3$ (Amer. Mus. 13710) of *Serridentinus obliquidens*, new species, one-half natural size.

sixth (or hexalophid) crests, by comparison with *Serridentinus floridanus*. (1) Besides the extreme ridge-crest obliquity, procumbency, external compression, and rudiment of a hexalophid, this specific stage is distinguished (2) by single but very prominent trefoil spur conelets, especially behind the second, third, and fourth cones. (3) These trefoil spur conelets are single instead of multiple, or serrate, as in many species of *Serridentinus*. The above characters are clearly portrayed in the accompanying type figure (Fig. 7).

Type inferior molar measurements: Anteroposterior 195 mm., transverse 82 mm., height of metalophid from base of crown 72 mm., height of tritolophid 79 mm.

***Serridentinus anguirivalis*, new species**

The type tooth of this species was first mistaken by Osborn (1921.522, p. 3, fig. 1 A1) as belonging to *Mastodon* [= *Pliomastodon*, new genus] *matthewi* and described as a paratype of a genus and species from which it is entirely distinct. The same specimen is now selected as the type of a new species, named *Serridentinus anguirivalis* in reference to its occurrence in the Snake Creek formation of Nebraska.

TYPE.—Amer. Mus. 17217. A second right superior molar, $r.M^2$.

PARATYPE.—Amer. Mus. 19248e. Posterior portion of a right third superior molar, $r.M^3$, consisting of metaloph, tritoloph, and tetartoloph.

HORIZON AND LOCALITY.—Snake Creek B horizon (upper), Pliocene, southern Sioux County, Nebraska; type from Quarry 7, paratype from Quarry 5.

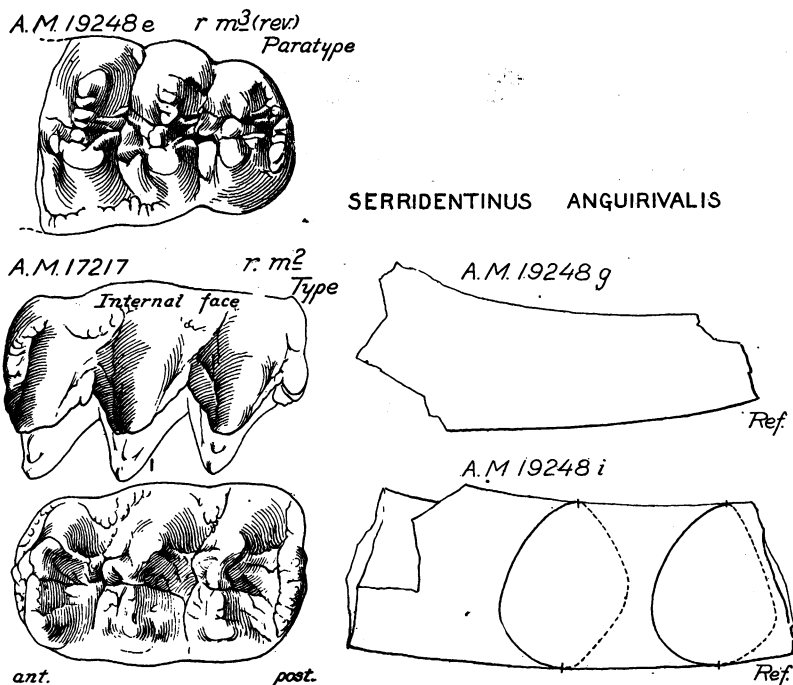


Fig. 8. Type, paratype, and referred specimens of *Serridentinus anguirivalis*, new species, one-third natural size.

Type (Amer. Mus. 17217), a second right superior molar, $r.M^2$.

Paratype (Amer. Mus. 19248e), a third right superior molar, $r.M^3$ (rev.).

Referred (Amer. Mus. 19248i, 19248g) superior tusk fragments.

TYPE CHARACTERS.—(1) Relative measurements indicate that this species was smaller and less progressive than *Serridentinus serridens*. (2) Trefoil spurs represented by low vertical ridges lacking the single or double conelets of *S. serridens*. (3) Postcingulum broad, ending in a prominent single conelet; internal cingulum lacking; external cingulum rudimentary, rugose. (4) Internal cones bifid at summit.

PARATYPE CHARACTERS.—(1) Right third superior molar, $r.M^3$, with four crests, protoloph (broken away), metaloph with five to six transverse conelets, tritoloph the same, tetartoloph with three transverse conelets. (2) Postcingulum rudimentary, internal cingulum strong in antero-internal portion.

***Serridentinus brewsterensis*, new species**

We may regard *Serridentinus brewsterensis* as less progressive than the sharply crested *S. anguirivalis*, new species, *S. serridens* Cope, and *S. præcursor* Cope; it agrees with *S. præcursor* in the posterior narrowing of M^3 and in the presence of only four ridge-crests.

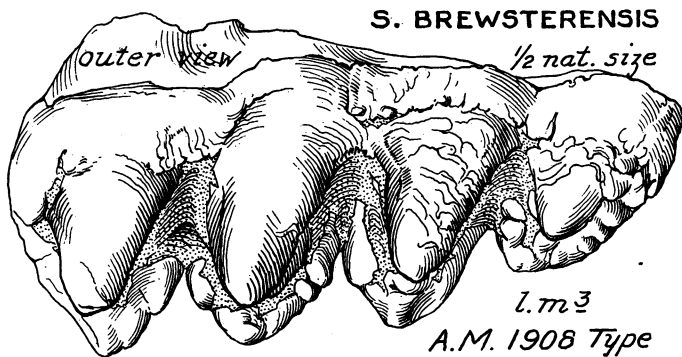


Fig. 9. Type third left superior molar of *Serridentinus brewsterensis*, new species (Amer. Mus. 1908), one-half natural size.

TYPE.—Amer. Mus. 1908. A third superior molar of the left side, $l.M^3$, part of the collection of the American Cyanimid Company of Brewster, Florida, and presented to the American Museum by Mr. H. L. Mead in 1924.

HORIZON AND LOCALITY.—Pliocene, Brewster, Polk County, Florida.

TYPE CHARACTERS.—(1) Four ridge-crests only, (2) the tetartoloph not more than two-thirds the height (elev. 45 mm.) of the protoloph (elev. 60 mm.), (3) total width of the tetartoloph (breadth 59 mm.) much less than the width of the protoloph (breadth 87 mm.), (4) total length of the crown (ap. 179 mm.) not far inferior to that of *Serridentinus floridanus* (ap. 210 mm.), (5) indication of cement in the valleys, (6) rudiments of external and internal cingula.

The type of this Florida species belongs nearer to the elevated and compressed southwestern phylum of *Serridentinus serridens* and *S. præcursor* than to the blunted cone series which includes *S. productus* and *S. floridanus*, yet the elevation, compression, and serrate condition of the crests have not progressed so far as in the type of *S. serridens*; for example, the type tritoloph of M^2 in *S. serridens* exhibits six conelets, whereas the type tritoloph of *S. brewsterensis* exhibits only five conelets; the trefoil spur conelets of *S. serridens* are much more prominent than those of *S. brewsterensis*.

***Serridentinus guatemalensis*, new species**

This single type grinding tooth represents the southernmost known distribution of *Serridentinus*.

TYPE.—Amer. Mus. 15540. Posterior portion of a third left superior molar, $1.M^3$. Part of the Emil Mosonyi collection purchased in 1910.

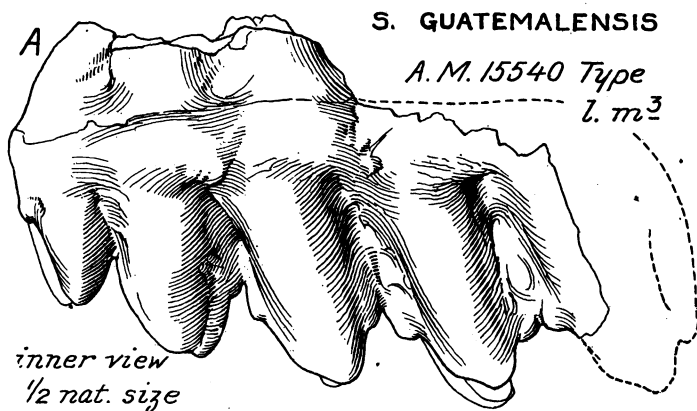


Fig. 10. Type third left superior molar of *Serridentinus guatemalensis*, new species (Amer. Mus. 15540), one-half natural size.

HORIZON AND LOCALITY.—Pleistocene (?). Chinautla, Guatemala, Central America.

TYPE CHARACTERS.—(1) Internal and external cones elevated, compressed, columnar. (2) Single trefoil conelets, anterior and posterior, on metaloph and tritolooph, no broad trefoil spurs as in *Serridentinus floridanus* or *S. productus*. (3) Double cones on summits of meta-, trito-, and tetartolophs. (4) Pentaloph consisting of two low cones (elev. 45 mm.), compressed at summit. (5) Crown narrowing posteriorly but less rapidly than in *S. serridens cimarronis* or in *S. præcursor*.

Rhynchotherium anguirivalis, new species

It would appear that *Rhynchotherium anguirivalis* was the largest mastodont of Snake Creek B (upper) times.

TYPE.—Amer. Mus. 19250. A well-worn third right inferior molar, r.M₃.

HORIZON AND LOCALITY.—Snake Creek B horizon (upper), Pliocene, Sioux County, western Nebraska, Quarry 3 (Olcott Hill).

SPECIFIC CHARACTERS.—(1) Type third inferior molar with four and a third ridge-crests, tetartolophid much narrower than tritolophid, the narrow pentalophid represented by four irregular conelets. (2) Number of superior ridge-crests uncertain, probably the same as in the *Rhynchotherium brevidens* type. (3) Enamel extremely thick and massive, without folding. (4) Inferior molars with single external median trefoils, superior molars with single internal median trefoils, no trace of double trefoils. (5) Molars low crowned, brachyodont. (6) Measurements of r.M₃, ap. 214 mm., tr. max. 98 mm., of l.M³, ap. 163e mm., tr. max. 83 mm.

A.M. 19250 Type

R. ANGUIRIVALIS

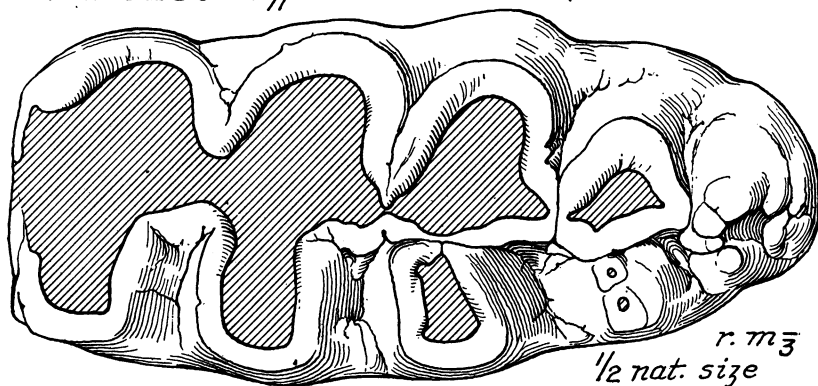


Fig. 11. Type third right inferior molar of *Rhynchotherium anguirivalis*, new species (Amer. Mus. 19250), one-half natural size.

Anancus falconeri, new species

Comparison of the type figures of *Anancus falconeri*, new species, from the Red or Norwich Crag of England, will leave no doubt of their complete separation from the cotypes of *A. arvernensis* of Auvergne, France. The new species is named in honor of Sir Hugh Falconer.

TYPE.—Last true molar from the left side of the lower jaw (*vide* Falconer), from the Red or Norwich Crag of Suffolk, England. Cas in Museum of Geological Society of London.

HORIZON AND LOCALITY.—Upper Pliocene Red or Norwich Crag of Suffolk, England.

TYPE FIGURE.—Falconer, 1857, Pl. xii, figs. 3 and 4, also Falconer, 1868, Vol. II, Pl. iv, figs. 3 and 4. Originally described and figured by Falconer (*op. cit.*, 1857, 1868) as "*Mastodon (Tetralophodon) Arvernensis*, from the Crag." Reproduced here-with as figure 12.

Fig. 3



Fig. 4.



G.H. Ford del. J. Dinkel lith.

W. West imp.

Mastodon (Tetralophodon) Arvernensis, from the Crag.

Fig. 12. Type third left inferior molar of *Anancus falconeri*, new species, about two-ninths natural size. Cast in the Museum of the Geological Society of London. After Falconer, 1868, II, Pl. iv, figs. 3 and 4, figured by him as "*Mastodon (Tetralophodon) Arvernensis*, from the Crag."

TYPE CHARACTERS.—In the five and a half ridges composing the crown, the cones are disposed alternately; the inferior cones are inclined strongly forwards, closely compressed at the summits, subhypsodont in height. Distinguished from the typical *Mastodon arvernensis* Croizet and Jobert, 1828, by the elevated, subhypsodont cones, strongly compressed at the summits, and by the plicated or folded enamel of the milk dentition. Ridge formula: $M \ 3 \ \frac{5 \ 1/2}{5 \ 1/2}$.

CORDILLERION, new genus

Genotypic species, *Mastodonte des Cordilières* Cuvier, 1806 = *Mastodon andium* Cuvier, 1824.

The generic name *Cordillerion* replaces the preoccupied name *Dibelodon* as used by Cope and Lull to embrace the two species *Mastodon andium* Cuvier and *M. humboldtii* Cuvier. In 1923 Osborn proposed the genus *Cuvieronius* to embrace *M. humboldtii* and related species.

GENERIC CHARACTERS.—(1) Superior tusks with broad enamel bands which are wound more or less spirally around the elongated tusks; (2) no inferior tusks; (3) grinding teeth narrow with sharply defined *single* trefoils on the internal side of the superior molars and on the external side of the inferior molars as in other bunomastodonts with single trefoils; (4) third superior and inferior grinding teeth moderately elongate, ridge-crest formula, $M\ 3\frac{4\frac{1}{8}}{4-4\frac{1}{2}-5\frac{1}{2}}$; (5) intermediate molars typically three crested (trilophodont), or four crested (tetralophodont); (6) superior and inferior molars invariably brachyodont, never hypsodont; (7) cranium depressed, as in *Trilophodon*; (8) adaptation chiefly to a mountain habitat, grinders adapted principally to a browsing habit, tusks used in the uprooting of plants for food.

These generic characters are more or less clearly displayed in the type specimens of the following species:

SOUTH AMERICA	MEXICO	TEXAS AND CALIFORNIA
<i>Cordillerion andium</i> Cuvier, 1824	<i>Cordillerion tropicus</i> Cope, 1884	<i>Cordillerion gratum</i> Hay, 1917
" <i>argentinus</i> Ame- ghino, 1888	" <i>oligobunus</i> Cope, 1893	" <i>edensis</i> Frick, 1921
" <i>bolivianus</i> Philippi, 1893		

BIBLIOGRAPHY

LARTET, EDOUARD.

1859. Sur la dentition des proboscidiens fossiles (*Dinotherium*, *Mastodontes* et *Éléphants*) et sur la distribution géographique et stratigraphique de leurs débris en Europe. Bull. Soc. Géol. de France, XVI (2), pp. 469-516, Pls. XIII, XIV, XV.

MAYET, LUCIEN

1908. Étude des Mammifères Miocènes des Sables de L'Orléanais et des Faluns de la Touraine. Ann. Univ. de Lyon, Nouvelle Série, I. Sciences, Médecine. Fasc. 24, pp. 1-336, Pls. I-XII, text figs. 100.

OSBORN, HENRY FAIRFIELD

- 1921.522. First Appearance of the True Mastodon in America. Amer. Mus. Novitates, No. 10, June 15, pp. 1-6, text figs. 1, 2.
- 1922.555. Species of American Pleistocene Mammoths, *Elephas jeffersonii*, New Species. Amer. Mus. Novitates, No. 41, July 8, pp. 1-16, text figs. 1-12.
- 1922.564. *Dibelodon edensis* (Frick) of Southern California, *Miomastodon* of the Middle Miocene, New Genus. Amer. Mus. Novitates, No. 49, October 23, pp. 1-4, 1 fig.
- 1923.601. New Subfamily, Generic, and Specific Stages in the Evolution of the Proboscidea. Amer. Mus. Novitates, No. 99, December 27, pp. 1-4.
- 1923.603. Linnæan Classification and Phylogenetic Classification of the Proboscidea. Palaeontologia Hungarica, Budapest, I (1921-1923), pp. 35-52, text figs. 1-5.
- 1924.630. *Serridentinus* and *Baluchitherium*, Loh Formation, Mongolia. Amer. Mus. Novitates, No. 148, November 11, pp. 1-5, text figs. 1, 2.
- 1924.634. Additional Generic and Specific Stages in the Evolution of the Proboscidea. Amer. Mus. Novitates, No. 154, December 24, pp. 1-5, text figs. 1, 2.