

[FROM THE AMERICAN JOURNAL OF SCIENCE AND ARTS, VOL. II, JULY, 1871.]

NOTICE
OF SOME
NEW FOSSIL MAMMALS FROM THE TERTIARY
FORMATION.

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IN association with the Reptilian fossils collected by the Yale College party last summer, and already described in this Journal,* numerous remains of Mammals were also discovered, and in the following article some of the more interesting new species are briefly characterized. A few species from the other Tertiary lake-basins of the Rocky Mountains have been included, as they throw considerable light on the ancient sub-tropical fauna of that region. The present notice is merely preliminary to a full description, with illustrations, now in course of preparation.

Titanotherium? anceps, sp. nov.

The largest extinct mammal discovered by our party in the Green River basin was apparently one of the rarest; and the remains obtained, although in themselves characteristic, include, unfortunately, none of the teeth sufficiently well preserved to afford generic characters. The single species thus indicated has accordingly been referred, with a doubt, to the genus *Titanotherium*, seemingly a near ally, until the discovery of additional material clears up the question of its exact affinities.

* Vol. i, 1871, pp. 192, 322, and 447.

The specimens discovered, which evidently pertained to three different individuals, mainly consist of several dorsal vertebræ, the distal end of a humerus, the greater portion of a tibia, and some of the smaller bones of the extremities. They indicate a Pachyderm, much larger than any other known mammal from the same deposits, and about two thirds the size of *Titanotherium Prouti*, from the Tertiary basin east of the Rocky Mountains. The anterior dorsal vertebræ preserved have both articular faces slightly concave, thus distinguishing the species at once from *T. Prouti*, which has in this part of the series the front vertebral face very convex, and the posterior face concave. Another marked difference is seen in the tibia, which at its proximal end has the femoral articular surfaces contiguous, with no prominent elevation between them, resembling in this respect some of the Proboscidea.

Measurements.

Length of anterior dorsal vertebra, on lower surface,	2 inches 2 lines.
Width of posterior face between rib cavities,	3 " "
Height of posterior face,	2 " 5 "
Transverse diameter of tibia at proximal end,	4 " 10 "
Fore and aft diameter,	4 " 3 "
Transverse diameter at distal end,	3 " 11 "
Fore and aft diameter,	3 " 3 "

The remains were found by Lieut. Wann, and the writer, in the "Mauvaises Terres" deposits, near Sage Creek, Western Wyoming. The geological horizon is lower Miocene, or perhaps Eocene.

Palæosyops minor, sp. nov.

This species is indicated by a molar tooth, from the right lower jaw, and probably by some other less characteristic remains. The tooth, which is apparently from near the middle of the series, is of the *Palæotherium* type, and nearly resembles in its main characters the corresponding molar of *Palæosyops*. The crown is composed of two united, antero-posterior lobes, with crescent-shaped summits. The anterior lobe is the more elevated, and the posterior has a greater fore and aft extent. The animal thus represented was apparently about as large as

the South American Tapir, and less than one half the size of *Palaeosyops paludosus* Leidy,* from the same deposits.

Measurements.

Antero-posterior diameter of lower molar,.....	10	lines.
Transverse diameter of front lobe, at summit,.....	5	“
Transverse diameter of posterior lobe, at summit,.....	5.6	“

The only known specimens of this species were found by the writer at Grizzly Buttes, near Fort Bridger, Wyoming, in the same deposits as the preceding species.

Lophiodon Bairdianus, sp. nov.

The remains on which this species is based consist of portions of several skeletons, with numerous teeth which show considerable variation in size and other characters of minor importance. The various specimens indicate an animal somewhat smaller than the modern Tapir of South America, but much larger than the *Lophiodon modestus*,† founded by Dr. Leidy on a tooth from the same Tertiary beds that afforded the fossils under consideration. From the latter species, so far as it is now known, the present specimens may be readily distinguished, moreover, by the enamel of the teeth, which, instead of being coarsely wrinkled, is nearly smooth, or marked by very delicate, irregular striæ.

Measurements.

Length of portion of upper jaw, enclosing the three posterior molars,.....	25	lines.
Antero-posterior diameter of last upper molar,.....	9	“
Transverse diameter of same,.....	10.25	“
Length of fragment of lower jaw with three posterior molars,	25	“

The specimens now representing this species, which is one of the most common fossil mammals in the earlier Tertiary of Western Wyoming, were found by G. B. Grinnell, J. W. Griswold, C. W. Betts, A. H. Ewing, J. M. Russell, and the writer, at various localities near Fort Bridger, and on the White River, in Eastern Utah. The species is named in honor of Professor S. F. Baird, of the Smithsonian Institution.

* Proceedings Philadelphia Academy of Natural Sciences, 1870, p. 113.

† Proceedings Philadelphia Academy of Natural Sciences, 1870, p. 109.

Lophiodon affinis, sp. nov.

A second and somewhat smaller species of the same genus, closely allied to the preceding, is indicated by various fragmentary remains, including several molar teeth in an excellent state of preservation. A comparison of the last upper molar with that of *L. Bairdianus*, shows, aside from the smaller size, a marked difference, especially in the contour of the crown, which has a deep notch in the outer posterior margin of the base, between the external tubercles in which the transverse ridges terminate. In the species just described, the margin is here nearly straight. The present specimen, moreover, has the small anterior external tubercle more prominent, and less closely connected with the adjoining ridge. This tooth is larger than the corresponding one of *Lophiodon modestus*, and has quite different proportions. The enamel, also, is similar to that in the preceding species.

Measurements.

Antero-posterior diameter of last upper molar.....	7.1	lines.
Transverse diameter of same,.....	8.3	"
Antero-posterior diameter of penultimate upper molar,	8.	"
Transverse diameter of same,.....	8.	"

The principal specimens on which this species is established were found by H. D. Ziegler, in the Mauvaises Terres beds, near Marsh's Fork, Wyoming.

Lophiodon nanus, sp. nov.

A small, well marked species, apparently of the genus *Lophiodon*, is represented by a number of fossils collected by the Yale party at various localities. The most characteristic of these specimens is a right upper jaw containing a series of four premolars, and three molars, and part of the corresponding left jaw with several teeth of the same animal. The molars differ especially from those of the two preceding species, in having a much shallower valley between the two transverse ridges, and in having a strong basal ridge, or shelf, at the external posterior corner of the crown. The enamel of the whole series is very smooth. The species was probably about two thirds the size of *L. modestus*.

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Measurements.

Length of portion of upper jaw, containing seven posterior teeth,	26·	lines.
Length of same, with three last molars,	13·7	“
Antero-posterior diameter of last upper molar,	5·	“
Transverse diameter of same,	5·25	“

The remains now known to represent this species were discovered by C. W. Betts, H. B. Sargent, and the writer, in the Tertiary strata at Grizzly Buttes, near Fort Bridger.

Lophiodon pumilus, sp. nov.

A still more diminutive species, of the same, or a nearly related, genus, is indicated by several specimens, including a fragment of a left upper jaw, containing three premolars and the two succeeding molar teeth. The species may easily be distinguished from the small one above described, by the presence, on the outside of the superior teeth, of a strong, continuous, but irregular basal ridge, which, at the external angle of the crown, replaces the elevated tubercle present in all the molars of the species already noticed. The present specimen may also be distinguished from *L. nanus*, by the form of the last two upper premolars, which in the latter have their greatest transverse diameter behind the center, while the reverse is true of these premolars in the species under consideration.

Measurements.

Length of portion of upper jaw, with three premolars, and next two molars,	14·	lines.
Antero-posterior diameter of penultimate upper molar,	3·25	“
Transverse diameter of same,	4·	“

The only specimens at present known to represent this species were found by C. T. Ballard, in the Tertiary beds near Marsh's Fork, Western Wyoming.

Anchitherium gracilis, sp. nov.

The Green River Tertiary basin of Wyoming apparently contains very few extinct solipedal mammals, one or two fragments only being all our party secured during several weeks of explorations. In the Uintah or southern basin, however, especially

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near the White River of Eastern Utah,* remains of this group are more abundant, and some characteristic specimens were obtained. Among these, were three lower jaws, with many of the teeth in good preservation. They represent an animal less than one half the size of *Anchitherium Bairdi* Leidy, and apparently belonging to the same genus. There are seven premolar and molar teeth, with essentially the same constitution as in that species. The first premolar has but one fang, and between this and the symphysis there are no teeth. On the inner face of each ramus there is a shallow, sickle-shaped impression, with the point directed forward, and terminating under the first premolar.

Measurements.

Length of portion of lower jaw, with six posterior teeth,	23.58	lines.
Length of same with three posterior teeth,	12.5	"
Antero-posterior diameter of last lower molar,	5.	"
Transverse diameter of same,	2.	"

The above specimens were discovered by C. T. Ballard and the writer, on the north side of the White River, in Eastern Utah. The geological horizon is upper Eocene, or lower Miocene.

Lophiotherium Ballardii, sp. nov.

A small Pachyderm, apparently nearly related to the genus *Lophiotherium*, is indicated by a fragment of a right lower jaw, with the last two molars, and a few less important remains. The species thus represented appears to have been about two thirds the size of *Lophiotherium sylvaticum*, recently described by Dr. Leidy from the same Tertiary basin in which these fossils were found,† and the teeth, so far as known, have nearly the same composition. Those preserved in the present specimen are somewhat worn, showing that the individual was fully adult. The enamel, especially on the sides of the crown, is much wrinkled, and thus the external basal ridge is rendered strongly serrated.

Measurements.

Antero-posterior diameter of last lower molar,	4.4	lines.
Transverse diameter of same,	2.1	"
Antero-posterior diameter of penultimate lower molar,	3.2	"
Transverse diameter of same,	2.25	"

* This Journal, vol. i, p. 196, March, 1871.

† Proceedings Philadelphia Academy of Natural Sciences, 1870, 126.

The species is named for the discoverer, Mr. C. T. Ballard, of the Yale party, who obtained the specimens here described at Grizzly Buttes, Western Wyoming.

Elotherium lentus, sp. nov.

The presence of numerous Suilline Pachyderms in the Green River Tertiary basin was clearly established during the investigations of our party by the discovery of several extinct species, all different from any hitherto described. One of these, which evidently belonged to the genus *Elotherium*, is represented by a single fragment of a left lower jaw, with the last molar in fine preservation. This specimen indicates a species about one half the size of *Elotherium Mortoni* Leidy, which is comparatively abundant in the lower Tertiary deposits east of the Rocky Mountains. The upper surface of this last lower molar is composed of two transverse pairs of conical lobes, with a single posterior one on the median line. The anterior inner cone is larger than its fellow, and has its summit bifid. In the next pair, which are much less elevated, the external lobe is the larger. The posterior cone is low, and shows a tendency to subdivide. There is a basal ridge in front, and indications of its continuation on the external border. The enamel is finely corrugated. There is a prominent rugose tubercle on the inner superior margin of the lower jaw, a short distance behind and above the last molar.

Measurements.

- Antero-posterior diameter of last lower molar, 9 lines.
- Greatest transverse diameter of same, 5 "
- Transverse diameter between first and second pair of cones, 4.4 "

The specimen on which this species is established was found by the writer, in October last, in the Tertiary beds, on Henry's Fork, Wyoming.

Platygonus Ziegleri, sp. nov.

Remains of another Suilline animal, fully as large as the modern *Sus scrofa*, were obtained in the same Tertiary beds with the last species. The most characteristic specimens discovered are a number of upper premolar and molar teeth, which agree so nearly in general composition with those of *Platygo-*

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nus, that they may very properly be referred to that genus. One prominent character in these teeth, especially the anterior ones, is the remarkably strong basal ridge, which, on the inner border at least of the first and second premolars, exceeds in breadth that in *Platygonus compressus* LeConte, although on the posterior margin it is less developed than in that species. The crowns of all the upper premolars are composed of a single transverse pair of cones, closely united. The second premolar in this specimen has a greater fore and aft diameter than the third. The enamel of all the teeth is rugose, as in the modern Pecaries.

Measurements.

Length of fragment of upper jaw, containing the three premolars, -----	18.5 lines.
Antero-posterior diameter of first upper premolar, -----	6. " "
Transverse diameter of same, -----	6. " "
Antero-posterior diameter of second upper premolar, --	6.5 " "
Transverse diameter of same, -----	7.3 " "
Antero-posterior diameter of third upper premolar, ----	6.2 " "

The species is named for H. D. Ziegler, of Yale College, who discovered the specimens on which the present description is based. The locality was at Grizzly Buttes, near the base of the Uintah Mountains.

Platygonus striatus, sp. nov.

A third Suilline species, nearly related apparently to the last, and quite equalling it in size, is indicated by portions of two lower jaws, with a few of the anterior teeth, collected by our party in the Pliocene strata of Northern Nebraska. In one of the specimens, the second left premolar is well preserved, and characteristic. It has the same general composition as the corresponding tooth in *Platygonus compressus*, but, in addition to its much larger size, it is proportionally broader, and has the basal ridge in front less developed. The posterior basal ridge, moreover, is expanded into two rudimentary tubercles. The enamel is marked by delicate irregular striæ, mostly parallel with the base of the crown, and to this ornamentation the specific name refers.

Measurements.

Length of portion of left lower jaw containing first four teeth,	25·	lines.
Length of same, with first three teeth,	17·	“
Antero-posterior diameter of second lower premolar, ..	6·2	“
Transverse diameter of same,	5·8	“

The above specimens were found by the writer, in July last, in the Pliocene sands, near the head-waters of the Loup Fork River, Nebraska.

Platygonus? Condoni, sp. nov.

The present species is founded on a portion of a right upper jaw containing the three posterior molars. The specimens evidently belonged to a true Suilline mammal, at least equal in size with the last two described. The exact generic relations of the species cannot at present be ascertained, but it differs essentially from any known recent or extinct American species of this group in several particulars. One of the most marked of these is the unusual elongated fore and aft proportions of the last upper molar, which has to the diameter of the penultimate tooth the ratio of three to two. The crown of the posterior molar is composed of two transverse pairs of principal cones, the front pair being the larger, and a posterior lobe, which is partially divided into three tubercles. The enamel is smooth, and there is no basal ridge on the sides of the teeth preserved.

Measurements.

Length of jaw enclosing last three upper molars,	27·	lines.
Antero-posterior extent of last molar,	12·	“
Transverse diameter of same, through anterior lobes, ...	7·	“
Antero-posterior extent of penultimate molar,	8·	“

This species is named for Rev. Thomas Condon, who discovered the specimen described, in the Pliocene beds of Oregon.

Dicotyles Hesperius, sp. nov.

A new and interesting small Suilline mammal is well represented by a portion of a right upper jaw, with the last premolar, and the succeeding three molars, all in excellent preservation. The teeth indicate an individual fully adult. They have nearly the composition of those of the modern Peccaries, and

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evidently belonged to the same, or a closely related, genus. The species is well marked, and was apparently not more than one half the bulk of *Dicotyles torquatus*. The crowns of the molars have a more rhombic outline than in that species, and a more distinct valley between the anterior and posterior pair of cones. The basal ridge is also more strongly developed, especially on the outer margin, where it is continuous. In other respects the composition of these teeth is very similar in the two species. The last upper premolar in the present specimen, however, differs widely from the corresponding tooth in any of the known Peccaries, living or fossil, resembling most nearly in its composition the second premolar of *D. torquatus*. The latter has, however, the single posterior cone distinct, while in the species under consideration it is connate with the anterior outer tubercle. The upper dental series is here somewhat curved outwardly, and not on a line, as in the living Peccaries.

Measurements.

Length of part of upper jaw with four posterior teeth, ..	19·	lines.
Length of same, with three molars,	15·2	"
Antero-posterior diameter of last upper molar,	5·6	"
Transverse extent of same,	4·	"
Antero-posterior diameter of penultimate upper molar, ..	5·4	"

This specimen, for which the writer is likewise indebted to Rev. Mr. Condon, is from the same locality and geological horizon as the species last described.

Hypsodus gracilis, sp. nov.

This species was about the same size as *Hypsodus paulus*, a small mammal described by Dr. Leidy from the lower Tertiary basin in Wyoming, and supposed by him to indicate an animal probably allied to the suilline family.* It may readily be distinguished from that species, especially by the first true molar of the lower jaw, which is proportionally narrower in front, and broader at its posterior margin. There is also on this tooth a strong external basal ridge, and, at the anterior inner angle, a prominent projection, which is wanting in *H. paulus*. The lower jaw is, moreover, deeper and more compressed in the region of the premolars.

* Proceedings Philadelphia Acad. Nat. Sciences, 1870, p. 109.

