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ON SOME EOCENE MAMMALS, OBTAINED BY HAYDEN'S GEOLOGICAL SURVEY OF 1872.

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HYOPSODUS PAULUS. Leidy.

Hayden's Survey, Montana, etc., 1871, p. 363.
From Cottonwood and South Bitter Creeks.

MICROSYOPS VICARIUS. Cope, sp. nov.

Founded on portions of the mandibular rami of two individuals from the Bad Lands of Cottonwood Creek, Wyoming. These represent an animal considerably smaller than the *Hyopsodus paulus*, and with probably only three premolars. This is believed to be the fact from the small size of the last premolar, and the anterior contraction of the first molar. The molars have no external cingulum nor antero-external tuberosity described to exist in the *M. gracilis*, by Marsh. The cones have simple apices, and the oblique connecting ridges of both genera.

	<i>H. paulus.</i>	<i>M. vicarius.</i>
	M.	M.
Length of three molars.....	0.0136	0.0115
“ last molar.....	.052	.0045
“ first molar.....	.040	.0038
Width “ anteriorly.....	.041	.0026
“ “ posteriorly.....	.043	.0029

ANTIACODON PYGMÆUS, Cope.

Lophiotherium pygmæum, Cope. Proceed. Amer. Philos. Soc., 1872, Extras July 29th. *Antiacodon venustus*, Marsh, Amer. Journ. Sci. Arts, 1872 (published, August 13th). *Hyopsodus pygmæus*, Cope, loc. cit., p. 461. From Cottonwood Creek, Wyoming.

ANTIACODON FURCATUS. Cope, sp. nov.

Established on a part of the right ramus mandibuli with the three molars and last premolar in perfect preservation. The crowns of the molars are composed of two external chevron-shaped tubercles, the apices rising as acute cusps, and two internal cones, the interior of which is flattened and strongly bifid, both points being more elevated than any of the others. The cusps are nearly opposite to each other, and behind the interval between the two posterior rises another, not so elevated as the others, except on the posterior molar. Here it is elevated, and nearly equidistant from the two in front of it. The enamel is smooth, and there is no cingulum on either side. The premolar consists of a principal sectorial cusp, and has a smaller but stout acute anterior cusp, with a small rudiment of another behind; a stout cusp rises from the inner posterior margin of the principal one, giving it a subbifid appearance.

<i>Measurements.</i>		M.
Length of four molars		0.0195
“ three true molars.....		.0149
“ last “ molar.....		.0055
“ first “ “0043
Width “ “ “ in front.....		.0025
“ “ “ “ posteriorly.....		.0031
Depth ramus at front of M. 3.....		.0075
“ “ “ P. M. last.....		.0055

This species differs from the last in the presence of the posterior tubercles on the M. 2-3, and the absence of external cingulum. The sizes are not very different.

From the Bluffs of the Upper Green River.

The genus to which this species belongs differs from *Hyopsodus* in the carnivorous form of the last premolar, which has a well-developed anterior cusp. I refer it to the same genus as the last species, though its characters have never been pointed out by the author of the name (Prof. Marsh), nor are the characters which distinguish it from *Homacodon* of the same author discoverable. He states that the cusps in *H. vagans* are “isolated,” a character which does not apply to *A. furcatus*, in which they are related much as in *Hyopsodus*.

OLIGOTOMUS CINCTUS. Cope, gen. et sp. nov.

Char. Gen. Molars constructed much as in *Hyopsodus* and *Lophiotherium*, viz.: with two external subtrihedral cusps which wear into crescents, the posterior connected by a low oblique ridge with the basis of the anterior cone of the inner side; the latter with two conic cusps. It differs from these genera and *Orotherium* in the possession of but two premolars; the inferior molars are probably six, leaving four true molars.

Char. specif. In this animal the cusps of the molars are elevated, the external most so, the anterior being somewhat bilobate. Premolars with two fangs. There is a rudimental posterior tubercle in M. 1 and 2, and a strong cingulum round the outer side of the crown. In an adult with worn teeth the enamel is obscurely rugose.

<i>Measurements.</i>		M.
Length of five molars.....		0.0326
“ two premolars.....		.0120
“ M. 2.....		.0067
Width “ anteriorly.....		.0050
“ “ posteriorly.....		.0050
Depth ramus at front of P. M. 1.....		.0126

From Cottonwood Creek, Wyoming.

OROTHERIUM SYLVATICUM. Leidy.

Lophiotherium sylvaticum, Leidy. Proceed. Acad. Nat. Sciences, Philadelphia, 1870, 126. *Orotherium*, Marsh, Am. Journ. Sci. Arts, 1872, August 13. From Black's Fork, Wyoming.

OROTHERIUM VASACCIENSE. Cope.

Lophiotherium vasacciense, Cope. Proceed. Am. Philos. Soc., 1872, July 11th (extras). *Notharctus vasaccensis*, Cope, l. c., 1872, 474.

This species is similar to the last in most respects, the corresponding molars differing in the more elevated yoke between the tubercles of opposite sides, and the presence of a posterior median tubercle.

From Green River beds near Evanston, and the same near Black Buttes, Wyoming, on opposite sides of the Bridger Basin.

TOMITHERIUM ROSTRATUS. Cope.

Proceed Amer. Philos. Soc., 1872, August 11th, p. 470.

This genus differs from *Orotherium*, among other points, in the simple second premolar, which is without posterior cusp. It appears to be nearly allied to the *Thinolestes* of Marsh, and was published on the same day. That genus was, however, not distinguished by Marsh from *Notharctus* and *Limnotherium*, so as to be recognizable. The species differs from all those described by the same author, so far as I can discover.

NOTHARCTUS LONGICAUDUS. Cope.

Pantolestes longicaudus, Cope. Proceed. Amer. Philos. Soc., 1872, p. 467 (August 3d).

I originally assigned but 3 P. M., to this species, but now find that it possesses four, and must be referred to *Notharctus*. It differs from all the species described by Marsh, in having the second premolar two-rooted, and from Leidy's two species in its slender proportions.

TRIACODON ACULEATUS. Cope.

Proceed. Amer. Philos. Soc., 1872, p. 460, July 29th.

The measurements of this species are somewhat larger than those given by Marsh, for his *T. grandis* (Amer. Journ. Sci. Arts, August 13, 1872); but the species may prove to be the same. The allied genus *Stypolophus*, Cope, is no doubt marsupial.

VIVERRAVUS PARVIVORUS. Cope.

Miacis parvivorus, Cope. Proceed. Amer. Philos. Soc., 1872, 470, (August 7th).

This species appears to belong to the genus *Viverravus* of Marsh, which bears date July 22, 1872, consequently sixteen days earlier than *Miacis*, which thus becomes a synonym. The species is different from those described by that author.

PARAMYS LEPTODUS. Cope, sp. nov.

Established on a right mandibular ramus with all the teeth preserved. It indicates an animal of about the size of the *P. delicatus*, Leidy, and *P. robustus*, Marsh, but with smaller incisors, which have little more than half the diameter of the same tooth in those species. The molars have two anterior separate, and three posterior contiguous

cones, the median smallest. The anterior and posterior of both sides separated by a deep excavation. The anterior tooth is peculiar in its greater compression. The posterior tubercles are not separated, and the anterior inner situate behind the outer, and connected with the posterior inner by a concave ridge.

Measurements.

	M.
Length molar series.....	0.0221
“ M. 4.....	.0060
Width “.....	.0055
Length M. 1.....	.0060
Width “.....	.0048
Diameter lower incisor, transverse.....	.0024
“ “ “ anterior posterior.....	.0038

From the South Bitter Creek, Wyoming.

PARAMYS UNDANS. Marsh.

Sciuravus undans, Marsh. Amer. Journ. Sci. Arts, 1871 (June 21st). A smaller species than the *P. delicatissimus*, Leidy. The dental characters of the mandibular series are generically identical with those of the species of *Paramys*.

From Upper Green River.

PARAMYS DELICATISSIMUS. Leidy.

Black's Fork.

PARAMYS DELICATOR. Leidy.

Cottonwood Creek and Black's Fork.

PARAMYS DELICATUS. Leidy.

Black's Fork.

PALÆOSYOPS DIACONUS. Cope, sp. nov.

Belonging to the genus *Palæosyops* as understood by Marsh, that is, with two cones on the inner side of the last superior molar. The species is as large as the *Limnolhyus major* of Leidy, but differs in the relative proportions of the teeth. Thus the last three molars have the same antero-posterior length, while the space occupied by four premolars is shorter. The anterior and posterior cingula of the true molars are very strong, but it is not well marked on the inner side between the cones. The latter are acutely conic, and the median anterior tubercle is strongly developed. Although the wearing of the teeth indicates maturity, the enamel is coarsely and obtusely rugose. The fourth premolar differs from that of *L. major* in its smaller size relatively and absolutely, and in the presence of a prominent vertical tubercle on the outer face, rising to the angle of the deep notch between the lobes. The third premolar is as wide as the fourth and about as large as the corresponding tooth in *L. major*, but different from it in the absence of tubercle and ridge that mark its external face. The first premolar has two roots, and the canine is large and short.

This large Palæotheroid is represented by parts of the two maxillary bones, which present the crowns of the third and fourth premolars, and of the second and third true molars with the bases of the other molars and premolars.

Measurements.

	M.
Length of entire molar series.....	0.1710
“ “ true molars.....	.1060
“ “ last molar (crown).....	.0420
Width “ “ “ “0437
Length second molar.....	.0350
“ fourth premolar.....	.0260
Width “ “0260
“ third “0200
Length “ “0200
Diameter of basis of canine.....	.0263

In comparing this species with *P. paludosus*, which also has the dental crowns rugose, I have Dr. Leidy's descriptions of 1870* and '71. In the first he describes a superior molar as “22 lines fore and aft, and 18 lines transversely,” which measurement would nearly apply to the penultimate of this species were the directions of the lengths exchanged. But in the second description,† the true molars are said to measure “ $3\frac{1}{2}$ inches” in length, which is nearly an inch less than in *P. diaconus*. The species must therefore be different. In comparison with Marsh's description of his *P. laticeps*, the measurements are all larger, and the enamel is as rugose as in *L. major*, instead of smooth. The shortening of the premolar series is greater in *P. diaconus*; thus in *P. laticeps* the two sets of molars are related as 94 mm. to 61; in the present one, as 106 : 65; were the proportions similar, the length of the premolar series should be 69 mm.

From Henry's Fork of Green River.

The species of this genus then are, in the order of size : *P. diaconus*, Cope ; *P. laticeps*, Marsh ; *P. paludosus*, Leidy ; *P. fontinalis*, Cope. There is however still some question as to the true position of *P. paludosus*.

HYRACHYUS IMPLICATUS. Cope, sp. nov.

This tapir is smaller and more slender than the *H. agrestis*, Leidy, but exhibits an equal size of posterior molar teeth, which are thus relatively larger than in that species. It is represented first, by both maxillary bones with most of the molars complete, from Cottonwood Creek, Wyoming ; then by the side of the face with molars of both jaws complete, with symphysis and portions of all the incisors, from South Bitter Creek ; and by part of mandibular ramus with teeth, from Green River, with probably other specimens.

* Proceedings Academy, Philadelphia, 1870, 113.

† Hayden's Geological Survey of Wyoming. 1871, p. 359.

The molars differ from those of the larger *Hyrachyi*, and resemble those of the smaller, in the presence of a prominent ridge which descends on the inner side of the principal (median) outer cusp, not quite reaching the valley below. It wears into a prominent loop. The anterior cusp is much less elevated than the median, and is separated from the latter by a considerable ridge. The only cingulum on the molars is on the outer side of the first; enamel smooth.

<i>Measurements, No. 1.</i>		M.
Length of five molars.....		.0710
“ three posterior molars.....		.0470
“ last molar.....		.0159
Width “.....		.0200
“ penultimate molar.....		.0210
Length “.....		.0168

In the more perfect specimen, all of the molars have two transverse crests except the P. M. 1. The lower molars possess strong anterior prolongations of their posterior crests; the 3d and 4th premolars have one elevated transverse crest near their middle, and the second is much compressed. The first I cannot find. Symphysis rather short for the genus.

<i>Measurements No. 2.</i>		M.
Length superior molar series....		0.085
“ true molars.....		.046
“ penultimate.....		.015
Width “.....		.019
Length inferior molar series.....		.078
“ “ true molars.....		.0475
“ penultimate.....		.0170
Width “.....		.0110
“ last premolar.....		.0080
Length “ “.....		.0120
Depth ramus at last premolar.....		.0235
Length diastema.....		.0190
“ of bases of three incisors.....		.0180

HYRACHYUS PRINCEPS. Marsh.

South Bitter Creek.

HYRACHYUS EXIMIUS. Leidy.

Cottonwood Creek, common.

HYRACHYUS AGRARIUS. Leidy. *Lophiodon bairdianus*. Marsh.

Common everywhere.

HYRACHYUS BOOPS. Marsh.

Bitter Creek, Black's Fork.

HYRACHYUS NANUS. Marsh.

Cottonwood Creek.

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