NO. 16.

THIRD NOTICE OF EXTINCT VERTEBRATA FROM THE TERTIARY OF THE PLAINS.

By Edward D. Cope.

Insectivora.

Domnina gradata. Gen. et sp. nov.

Represented by a portion of the right mandibular ramus with three entirely preserved molars. These teeth increase in size regularly from behind forwards, so that the anterior is relatively large; there are no indications of alveoli anterior to this one, but a considerable internal canal rises in front of it, and the mental foramen issues below it. The crowns of the molars are composed of two rows of alternating tubercles with an odd one in front. The inner tubercles are much the more elevated and form the apices of Vs, of which the inner commence the limbs.

Char. specif. Three rows of acute tubercles on the inner, two on the outer side of each dental crown, the last pair of the last crown fused into a heel; the middle inner and anterior outer forming together a notched yoke. A low cingulum on outer, none on inner basis of tooth crown; enamel smooth.

Measurements.

	M.
Length of basis of three molars	.0055
" " first "	.0023
" " last "	.0015
Depth of ramus at first molar	.0026
Width of first molar	.0015

Herpetotherium fuzax. Gen. et sp. nov.

Established on a left mandibular ramus incomplete at both extremities, but exhibiting the crowns and alveoli of five molar teeth. These diminish in size anteriorly, and there is no anteriorly exposed canal or alveolus, and there is no mental foramen visible. The crowns are composed of two rows of tubercles, but the inner are low and sometimes obsolete, and there is an anterior lobe. The inner lobes are much the higher.

Char. specif. Enamel smooth, no cingulum on either side. Molars truncate behind. Outer anterior lobe acute, considerably the higher.

Measurements.

	M.
Length of bases of four molars	.0070
" " second "	.0020
Width " " "	.0012
Depth of ramus at " "	.0030

This species and the last were about the size of our mole, and no doubt possessed similar insectivorous habits.

DAPTOPHILUS SQUALIDENS. Gen. et sp. nov.

General character of dentition as in *Machaerodus*, but the mandibular teeth are L. 1; Pm. 3; M. 1; a premolar tooth being added. Second premolar three lobed; carnassial tooth with short cutting heel; tubercular none. Superior canine much compressed, denticulate, not grooved.

Char. specif. Third premolar with the anterior basal tubercle very large, equalling, relatively, the corresponding lobe of the carnassial (much smaller in *Dinictis felina*). Second premolar two-rooted. Enamel smooth. Ramus decurved at symphysis. Superior canine in shape like a tooth of a shark of the genus *Oxyrhina*; flat within, slightly convex without; the front cutting edge turned inwards at the basis.

Measurements.

	M.
Length basis of three posterior molar teeth	.040
" " second " "	.010
Elevation crown " " "	.009
Length " fourth " "	.017
Elevation " " " "	.013
Depth ramus at " " "	.015
" " second " "	.018
Length fragment upper canine	.025
" " " " at base	.011

Size of the Panther

TOMARCTUS BREVIROSTRIS. Gen. et sp. nov.

Established on a mandibular ramus supporting a perfect carnassial tooth and fangs of the following dentition: C. 1; M. 4; the last incomplete, hence the number of posterior teeth unknown. The ramus is much narrowed in front. The carnassial has an inner tubercle behind the median lobe, and a large posterior heel supporting both inner and outer tubercles. The succeeding tooth was wide.

Char specif. First premolar one, second two-rooted. Anterior half of the carnassial with the usual sectorial structure, the anterior lobe the smaller. The inner tubercle about the same height. The heel constitutes one-third the length of the tooth, and its lateral tubercles are angular, the posterior low. Enamel slightly rugose.

Measurements.

	M.
Length of first three molars	.041
" third molar (carnassial)	.023
Elevation " "	.014
Width " " at middle	.009
Length of heel do.	.007
Depth ramus at do.	.021

In the abbreviation of the dental series in front, this species resembles the Feline group, while its expansion behind and the tubercular charac-

ter of the carnassial tooth reminds me of bears. The species resembles the black bear in the size of the mature molars.

STIBARUS OBTUSILOBUS. Gen. et sp. nov.

Represented by a portion of a mandibular ramus which supported the three anterior premolars. The form of the last indicates that it immediately preceded the sectorial, so that the series numbered one less than in *Canis*, to which the genus appears to be allied. The teeth are elongated and compressed with low crowns and flattened roots; the crown of the third is four-lobed.

Char. specif. Thin premolar with large anterior lobe and posterior heel. Median lobes obtuse; three last lobes connected by a low edge. Enamel slightly rugose.

Measurements.

	M.
Length bases of three premolars	.016
" " third "	.008
Elevated crown " "	.004
Depth ramus at " "	.007

CANIS GREGARIUS, sp. nov.

Abundant in the *Oreodon* beds of the Miocene formation, and about the size of the red fox. First premolar one-rooted, second molar two-rooted and with two transverse tubercles. Fourth premolar with median and basal lobes, forming a cutting edge in line. Sectorial with stout inner tubercle and short heel.

	M.
Length molar series	.036
" premolar "	.019
" fourth premolar	.006
" sectorial	.009
Width "	.004
Height "	.006
Depth ramus at sectorial	.010

A second and larger species occurs with the preceding.

ISACUS CANICULUS. Gen. et sp. nov.

Established on a mandibular ramus with two molars including the sectorial, which is illustrated by a similar specimen with two posterior molars. The genus has three tubercular molars, of which the two anterior are composed of two elevated cross-crests, which form partial Vs, opening to the inner side. The sectorial supports three anterior conic tubercles, the inner and outer equal, and a heel with a conic tubercle on the outer side.

Char. specif. Tubercular teeth with anterior limbs of Vs much shorter than posterior, the posterior connecting the longer limbs. A cingulum in front only. Lobes of sectorial acute, anterior and posterior lower, sub-equal.

	M.
Length sectorial and two tuberculars	.0210
" " alone	.0045
Width "	.0020
" first tubercular	.0030
Length " "	.0032
Depth jaw at do.	.0060

This genus differs from *Amphicyon* in the large development of the internal tubercle of the sectorial and in other points.

Rodentia.

PALÆOLAGUS TURGIDUS, sp. nov.

The largest species of the genus. Molars with two simple columns, the first and fifth grooved on the outer side only, the interior grooves of the others weaker. A porous enlargement on the inner inferior part of the ramus just behind the symphysis. Diastema obtuse.

Measurements.

	M.
Length of molars	.016
" three median	.010
Depth ramus at central	.011
Width central tooth	.0035
Length three central molars in a second specimen	.0115

Larger than *P. haydenii* and still larger than *T. agapetilla.*

PALÆOLAGUS TRIPLEX, sp. nov.

Size of the last; first and last molars deeply grooved on both sides as well as all the rest; first molar with a trifolium-lobate crown. Median three molars with a narrow posterior column as in *P. agapetillus.* Punctate patch on inner face of ramus extensive.

	M.
Length molar series	.016
" median three molars	.010
Width of median molar	.003
Depth ramus at " "	.011

This species and the last are rather larger than the prairie marmot (*Cynomys ludovicianus*).

The superior dentition in this genus is I. 2; C. 0; M. 5. The molars are fissured on the inner side in all the species, and on the outer also in one of them.

TRICIUM AVUNCULUS. Gen. et sp. nov.

Char. gen. Inferior molars ? 4, the first composed of three columns, well rooted. Otherwise as in *Palæolagus.* The larger species referred to this genus may possibly have five inferior molars, a point I cannot now decide. The first molar is more distinctly rooted than in *Lepuso* and I suspect that the present genus has, like *Palæolagus,* not more than five superior molars.

Char. specif. Size very small. The molars, except the first, with a distinct but narrow posterior third column, their sides grooved nearly to the centre. Incisor sub-triangular in section.

Measurements.

	M.
Length of anterior three molars	.0066
" first molar	.0024
Width " "	.0018
Depth ramus at first molar	.0060

Other specimens are a little smaller than the above.

TRICIUM LEPORINUM, sp. nov.

This species is larger than the last, and the molars lack the posterior column which it possesses. The first molar is narrowed in front, and is not grooved to the base on either side; the second is grooved to the alveolar wall on the inner side only, the others on both sides.

Measurements.

	M.
Length of anterior three molars	.0076
" first molar	.0025
Width " "	.0020
Depth of ramus at first molar	.0070

Tricium agapetilla is allied to this species; I originally referred it to *Palæolagus* (see Bulletin No. 15).

TRICIUM PANIENSE, sp. nov.

This species is similar in the dentition of the anterior part of the jaw to the last species, but is quite distinctly larger, as the following measurements explain. The region of the diastema is quite stout, and the incisor convex on the anterior face.

Measurements.

	M.
Length of two anterior molars	.0068
" first molar	.0032
Width " "	.0021
Depth ramus at first molar	.0085
" " diastema	.0061

GYMNOPTYCHUS CHRYSODON. Gen. et sp. nov.

Char. gen. The essential features are, dentition; I. $\frac{1}{1}$; C. $\frac{0}{0}$; M. $\frac{5}{4}$; the molars with two crescents on the inner side above, each of which gives rise to a cross-ridge to the outer margin. In the mandibular series the crests and crescents have a reversed relation. No cementum.

Char. specif. First upper molar a single cone. Incisors quite compressed. First inferior molar a broad oblong, the cusps opposite, the anterior close together. The two posterior cross crests do not form a V, the anterior being interrupted at the cusp. There is a delicate tubercle

between the outer cusps of the three last molars. The incisor is compressed, the anterior and outer faces being separated by an angle.

	M.
Length of molars	.0140
" penultimate molar	.0033
Width " "	.0035
" first molar	.0030
Length " "	.0035
Depth jaw at penultimate do.	.0090
" incisor tooth	.0040
Width " "	.0020

The skull is broad and stout but not depressed; muzzle broad above, short. Front moderately contracted, no postorbital processes.

GYMNOPTYCHUS NASUTUS, sp. nov.

Much smaller than the last. Inferior molars with two cross-crests and two cingular from the external cones, each posterior crest of a pair terminating in an interior cone. First molar narrower. The anterior part of a cranium probably belongs to the same species. The first molar has a sub-round crown with four tubercles; the second is constructed like the corresponding inferior. Muzzle much compressed, nasal bones flat, extending to beyond above incisors.

Measurements.

	M.
Length anterior three molars	.0045
" first molar	.0015
Diameter inferior incisor	.0008
Depth ramus at second molar	.0036
Length diastema above	.0080
Width at pre-orbital region	.0073
" end of muzzle	.0030

GYMNOPTYCHUS TRILOPHUS, sp. nov.

Ramus depressed, elongate. Molars with two outer crescents separated by a deep notch, each of which gives rise to a single cross-crest, an anterior and posterior, without cingula. The inner apices of the crescents unite and give origin to a short median cross-crest.

Measurements.

	M.
Length four molars	.0070
" second "	.0017
Width " "	.0015
Depth ramus at second molar	.0035
Width of lower incisor	.0010

GYMNOPTYCHUS MINUTUS, sp. nov.

A very small species. Middle pair of molars with the anterior and posterior cross-crests bifurcate, and a short median cross-crest. Only

three cross-crests on the fourth, and four tubercles on the first. Ramus deep.

Measurements.

	M.
Length of inferior molars	.0040
" second "	.0010
Width " "	.0010
Transverse diameter incisor	.0008
Depth ramus at second molar	.0030

Scarcely larger than the house mouse.

Perissodactyla.

ANCHITHERIUM CUNEATUM, sp. nov.

Represented by the superior molar teeth of several individuals one-third smaller than those of the *A. bairdii*. The prominent peculiarity consists in the anterior production of the anterior external cusp anteriorly, giving a wedge-shaped outline to that part of the tooth. The first premolar is quite small. The fore and aft cingula are well developed, and the basal parts of the transverse ridges are partially separated into tubercles, the posterior one sending a low ridge backwards.

Measurements.

	M.
Length of M. 2 and 3 of No. 1	.0260
" M. 1 "	.0130
Width " "	.0110
Length of Ms. 1–4, No. 2	.0410
" M. 2 "	.0115
Width " "	.0130

Artiodactyla.

LEPTAUCHENIA CALCARATA, sp. nov.

Established on a superior maxillary bone which supports Pm. 3 and 4, and M. 1, 2 and 3 in perfect preservation, and probably by other remains.

The species is characterized by the presence of an additional narrow column with acute apex behind the posterior outer crescent. A similar cusp exists in front of the anterior cusp, as in other species. The third premolar is little longer than the fourth, and the inner cusp is very small.

Measurements.

	M.
Length of five molars	0.0260
" three true molars	.0175
" last " "	.0080
Width " " "	.0070

This species is smaller than the smallest of the genus yet described.

LEPTAUCHENIA MINIMA, sp. nov.

Represented by numerous remains of a species not larger than a gray squirrel.

The antero-exterior vertical ridge is more prominent, and overlaps the preceding tooth more extensively than in the other species. The posterior superior molar is narrowed behind, and has a small heel column. In the mandible the third premolar is three-lobed, and the first premolar is not separated from the second by a hiatus. Enamel smooth. The valleys of the anterior lower molars disappear with use more frequently than in some of the allies.

Measurements.

	M.
Length of true molars above (No. 1)	.0120
" last "	.0050
Width " "	.0030
Length three inferior posterior molars (No. 2)	.0130
" " last molar	.0058
Width " " "	.0025

Probably the least known species of Artiodactyle.

TRIMERODUS CEDREUSIS. Gen. et sp. nov.

Char. gen. Molars constructed as in *Leptauchenia;* the last premolar three-lobed externally, internally with one, a posterior lobe. Exterior ribs prominent.

Char. specif. First true molar with anterior and posterior cingulum, and with the inner crescents more elevated on the anterior limb. Last premolar with a broad cingulum within the two anterior lobes.

Measurements.

	M.
Length first molar	.0060
Width " "	.0055
Length last premolar	.0070
Width " "	.0040

Size equal to that of *Leptauchenia calcarata.*

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