

VI. SOME NEW MERYCOIDODONTS.

BY EARL DOUGLASS.

During the various expeditions of the Carnegie Museum in Montana and North Dakota many remains of Merycoidodonts have been obtained from various localities and geological horizons. Much of this material was supposed to be new to science, but it was not until the types and other specimens in the museums at Washington, Princeton, New York, and New Haven were examined, and the collections in the Carnegie Museum were cleared from the matrix and made accessible for study and comparison, that the new species could be intelligently described. The collection has been placed in the hands of the present writer by the Director of the Museum, Dr. Wm. J. Holland, with the request that preliminary accounts of the new material be given, pending the preparation of a more complete memoir.

The following species are based, it is believed, on sufficiently complete material. Other remains which are interesting and are undoubtedly new, but not complete enough to be satisfactorily treated as types, will be described in a later paper.

***Eucrotaphus dickinsonensis* sp. nov.**

(PLATE XXII.)

(Type No. 1584, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type, which was collected by Earl Douglass in 1905, consists of a nearly complete skull and mandible with the greater portion of the spinal column, and fragments of limb and foot bones. The specimen was found near the top of the thick nodular beds of the Middle White River ("Oreodon") horizon of the Little Bad Lands near Dickinson in North Dakota. Though not suspected at the time when the specimen was collected, it is barely possible that it may have come from the upper beds which contain remains of *Eucrotaphus major* (?). The remains were not imbedded in their original position and they may have been derived from a higher level, though the specimen is quite different from any species of *Eucrotaphus* so far found in the upper beds. It is also different from the one specimen of *Eucrotaphus bullatus* ? which was found in the upper portion of the "Oreodon" Beds.

The size is about the same as that of *Merycoidodon culbertsoni*. The upper antero-posterior line of the skull is convex, the brain-case well

rounded, and the sagittal crest low. The posterior portions of the nasals are attenuated and the lachrymal pits shallow. The face is concave above the premolars, especially anterior to the infraorbital foramen, which is over P^3 . The tympanic bullæ are very large and high and are elliptical in horizontal section. The pit for the tympanohyal and the stylomastoid foramen are nearly equal in size. The mastoid process is fairly heavy, but does not extend far downward between the exoccipital and the external auditory meatus. The paroccipital processes are five-sided at the base, four-sided lower down, and three-sided near the tips. There is a postero-external ridge and the antero-internal side, which is closely pressed against the postero-external side of the bulla, is concave. There is no foramen rotundum.

The crowns of the upper premolars incline backward or the outer crescents have a long convex cutting border and a shorter concave posterior border. The fourth upper premolar is different from that of Merycoidodonts in general, in having two anterior fossettes as in P^1 , P^2 , and P^3 .

The chin is slightly concave. The anterior border of the ascending ramus of the mandible is nearly perpendicular and the coronoid process is not deflected backward. There is a small sharp cusp on M^3 between the posterior external crescent and the heel, which I have not observed in any other Merycoidodonts.

The specific name refers to the prosperous town of Dickinson, which is not far from the locality where the specimen was found.

MEASUREMENTS.

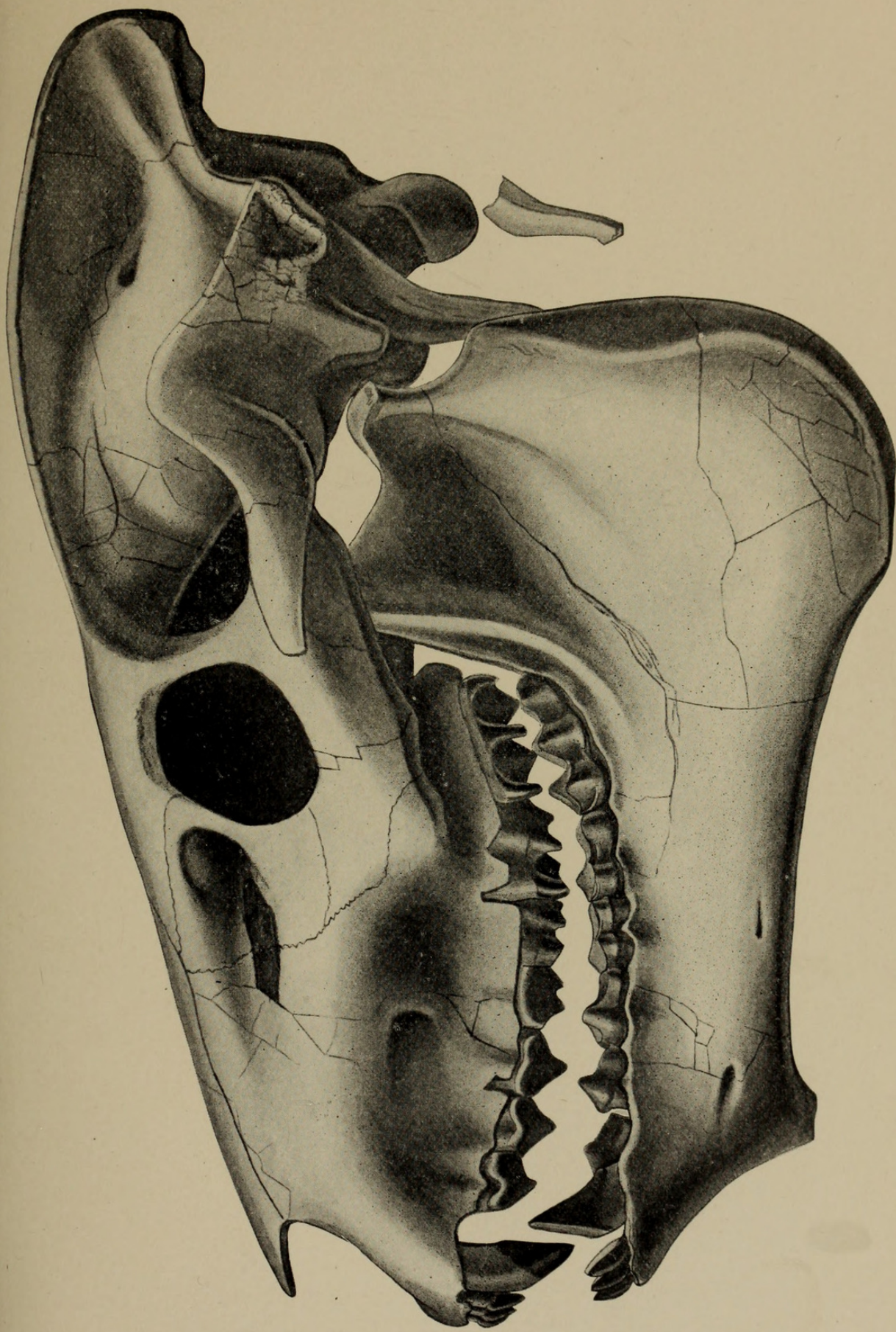
	mm.
Length of skull, basal measurement	184
Width of skull at posterior orbits.....	105
Length of molar-premolar series	85
Length of premolar series.....	40
Length of molar series	45

Eucrotaphus montanus sp. nov.

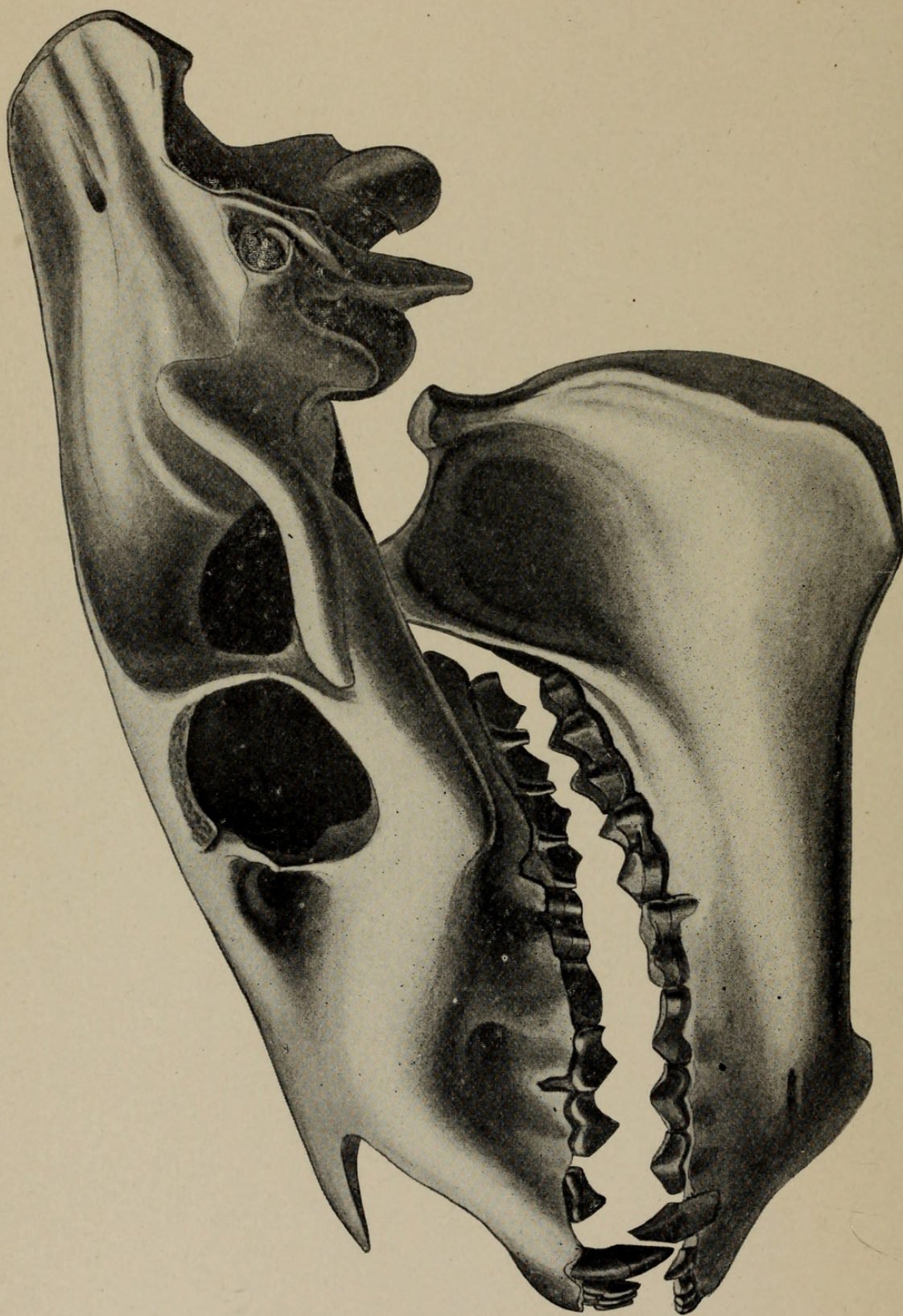
(PLATE XXIII.)

(Type No. 907, Carnegie Museum Catalogue Vertebrate Fossils.)

The type, which was collected by Earl Douglass, 1903, consists of nearly an entire skull with the mandible, a pelvis, a sacrum, and nearly all the presacral vertebræ. It was found near Stubb's old ferry on the Missouri River about eleven miles northeast of Helena, Montana, in a soft, sandy deposit. This was the only good speci-



Eucrotaphus montanus Douglass (Type), $\frac{2}{3}$.



Skull of *Merycooides cursor* Douglass, $\frac{3}{4}$.

men obtained in this locality and horizon, but the beds evidently overlie the Lower White River, which occupies a large area just north of this outcrop.

The upper molar teeth have nearly the same antero-posterior diameter as the corresponding teeth of the type of *Oredon* (*Eucrotaphus*?) *major* Leidy,¹ but the transverse diameter is a little greater.

The species is a little larger than the specimen figured as *Oreodon major* in Leidy's "Extinct Mammalian Fauna of Dakota and Nebraska"; all the upper premolar and molar teeth are longer than wide; the incisors are small; the molars increasing in length posteriorly; P_2 overlapping P_1 inwardly; the length of the upper and lower molar series is nearly one and one-fourth times the length of the corresponding premolar series; the tympanic bullæ are inflated, and of medium size; the paroccipital processes are flattened on the inner surface where they press against the posterior outer portion of the tympanic bullæ. They are slender and are directed antero-posteriorly below the bullæ, but somewhat twisted on themselves near the ends; the arrangement of the elements at the posterior base of the skull is nearly as in the species of *Promerycochærus* from the Cañon Ferry Beds; the orbits are fairly large, the malar moderately deep; the posterior portion of the zygomatic arch is only moderately heavy; the sagittal crest is high and thin; the infraorbital foramen is located over P^4 ; the anterior portion of the mandible is low, but increasing in depth backward to the angle which is very large and rounded; the coronoid processes are low.

MEASUREMENTS.

	mm.
Length of skull, total	239
Height of skull.....	72
Length of upper premolar series.....	48.5
Length of upper molar series.....	55.5

Named after the state of Montana.

Merycoides cursor gen. et sp. nov.

(PLATE XXIV.)

(Type No. 1222, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type, which was collected in 1902 by Earl Douglass in the Miocene beds at Cañon Ferry, Montana, includes a skull and mandible nearly complete, the lower portion of a shoulder blade, part of a

¹"Ancient Fauna of Nebraska," p. 55, Plate IV., Fig. 6.

humerus, the upper end of the radius, the head and distal end of the femur, portions of two tibiæ, a tarsus, a third and a fourth metatarsal, lacking the distal ends, and a rib that was broken and mended during the life of the animal.

Skull rather low, broad and heavy in proportion to its length; nasals shortened; muzzle inflated; frontal plane rather broad and flat; brain-case laterally inflated; sagittal crest and occipital low, the latter projecting posterior to the occipital condyles; zygomatic arches slender and the posterior angles low; no lachrymal vacuities; paroccipital processes three-sided and placed behind the tympanic bullæ, which are moderately large; basi-occipital forming a considerable angle with the plane of the palate; foramen rotundum just anterior to foramen lacerum medium. Limbs and hind feet slender for a Merycoidodont, the proportions being similar to those of Limnenetes but not so slender as in Merychys.

Teeth brachyodont with a tendency to become hypsodont. The molar series somewhat exceeding the premolar series in length; canines and incisors small; dental series converging anteriorly; the last molar without a backward projecting lobe or heel.

MEASUREMENTS.

	mm.
Length of skull, total.....	211
Width of skull, greatest.....	117
Height of skull, greatest.....	51
Length of upper molar-premolar series.....	86
Length of upper premolar series.....	40
Length of upper malar series.....	46

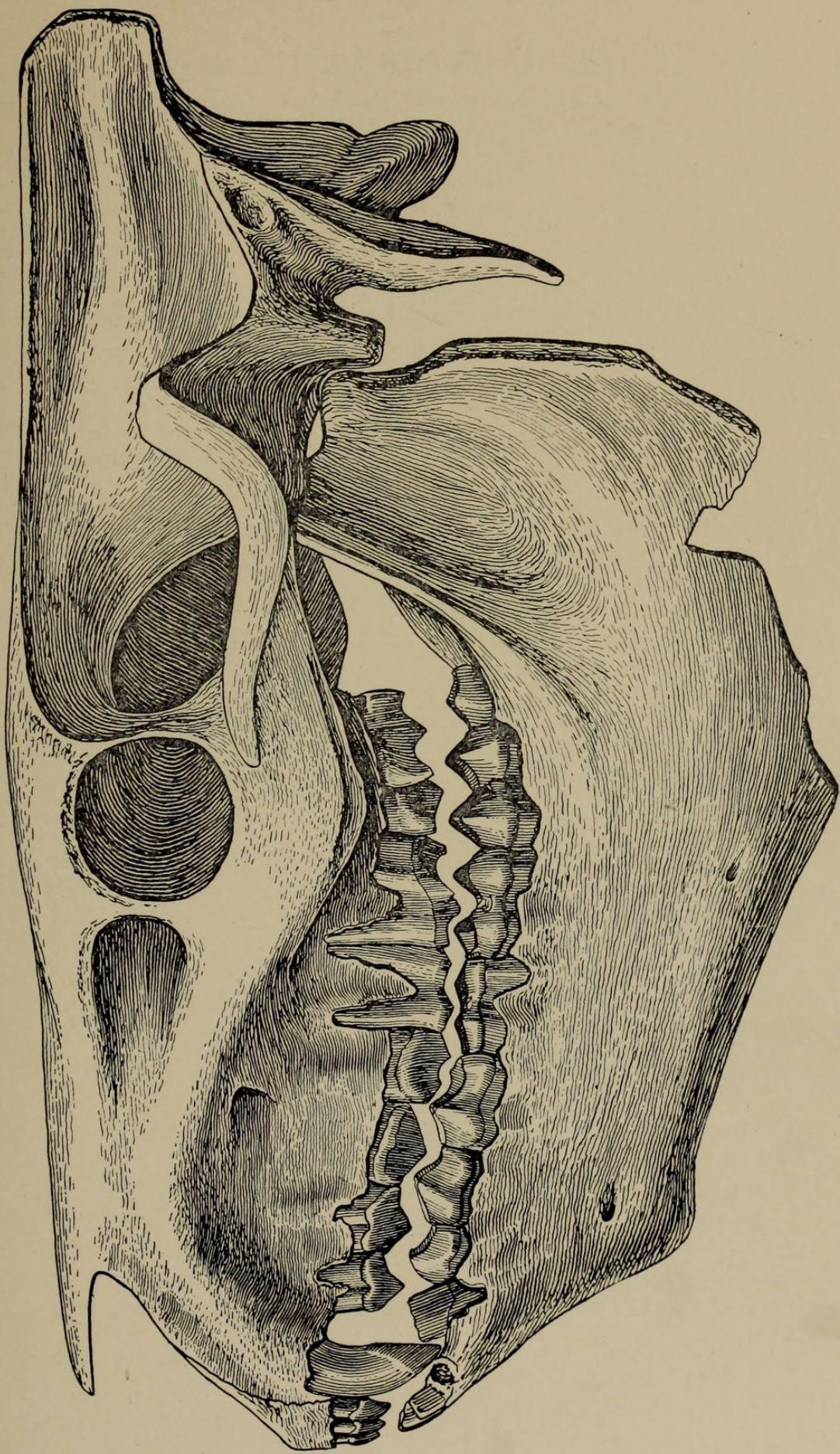
Mesoreodon (?) latidens sp. nov.

(PLATE XXV.)

(Type 908, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type consists of a skull and a mandible lacking portions of the angles. From the Cañon Ferry Beds (Miocene) on the Missouri River about twenty miles east of Helena in Montana. Collected by Earl Douglass, 1902.

This species is placed provisionally in this genus. It is quite different from the type specimen of *Mesoreodon chelonys*, which is very close to some of the Upper Oligocene forms such as *Eucrotaphus* or *Eporeodon*, but other skulls from the Princeton collection (Nos. 10410 and 10418) seem to the writer to be somewhat different from the type and more nearly related to the present species which is undoubtedly somewhat later in age.



Mesoreodon (?) *latidens* Douglass (Type), $\frac{2}{3}$.

In the Carnegie Museum collection are two skulls (Nos. 908 and 1234) both of which are somewhat crushed vertically; but the original form was evidently rather low and broad and the upper contour nearly straight. The nasals are unreduced in length. They narrow quite rapidly anteriorly and gradually posteriorly to near the anterior portion of their contact with the maxillaries. The sagittal crest is thin but only moderately high. The malar is quite heavy beneath the orbits, but the zygomatic process of the temporal is long and slender. Its posterior upper angle is curved inward, scroll-shaped and nearer to the orbit than to the posterior part of the skull. The occiput is low and the external wings broad.

The tympanic bullæ are inflated, but not extremely large. The post-glenoid processes are external to the anterior portions of the bullæ, while the inner, thickened portions of the paroccipital processes are posterior to the outer portions of the bullæ. The external auditory meatus opens at the supra-auricular border.

The teeth are characteristic. They are only moderately hypsodont. The molar is larger than the premolar series in both jaws. The upper molar and premolar teeth in the type, with the exception of P^4 are heavier than those figured by Scott as *Mesoreodon chelonys* in his "Mammalia of the Deep River Beds"; the length is nearly the same, but they are much wider. The premolars are not triangular, but are more quadrate. P^2 which is much larger than P^1 , is oblique, being directed antero-internally and postero-externally. The cingulum which almost forms a cusp on the postero-internal portion of the tooth encloses a comparatively broad, shallow basin. On P^3 this postero-internal cusp is large. In specimen No. 1234 the teeth are not so heavy, and the skull may have belonged to a female. The length of the few foot bones which are preserved are nearly the same as those figured by Scott.

MEASUREMENTS.

	mm.
Total length of skull.....	244
Height of skull above angle of mandible approximately.....	155
Greatest width of skull.....	140
Length of molar-premolar series	125
Length of premolar series	57
Length of molar series	68

Promerycochærus hatcheri sp. nov.

(PLATE XXVI.)

(Type No. 1303, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type is a nearly complete skull with the mandible. It was collected by the writer in 1902 from the same deposits and the same locality as the types of *Promerycochærus grandis*, *P. hollandi*, and the species of *Merycoides* described in this paper.

The general form and proportions of the skull are very much like those of *Promerycochærus grandis* but it is much smaller and the teeth are decidedly less heavy than in that species, the post-glenoid processes are not antero-posteriorly compressed, the antero-posterior diameter being nearly as great as the transverse, the zygomatic processes of the squamosals are slender, and the infraorbital foramen is about the interval between P^3 and P^4 , not over the space anterior to M^1 . The anterior contour of the chin is straight, not concave, and the angle of the mandible is large. The upper portion of the ascending ramus is not like that of *Promerycochærus grandis* but is much like the usual form in *Merycoidodonts*. The fossa postero-superior to the last molar is only slightly if at all enlarged. There is no median inner ridge or accessory cusp on P^3 . The outer face of the outer crescent of P^4 is more concave than in the corresponding tooth of *Promerycochærus grandis* and the median outer pillars on the molars are inclined more forward, while the anterior pillars on the last two molars incline more backward. The lower premolars are thin, being laterally compressed.

Named in honor of the late J. B. Hatcher, of the Carnegie Museum.

MEASUREMENTS.

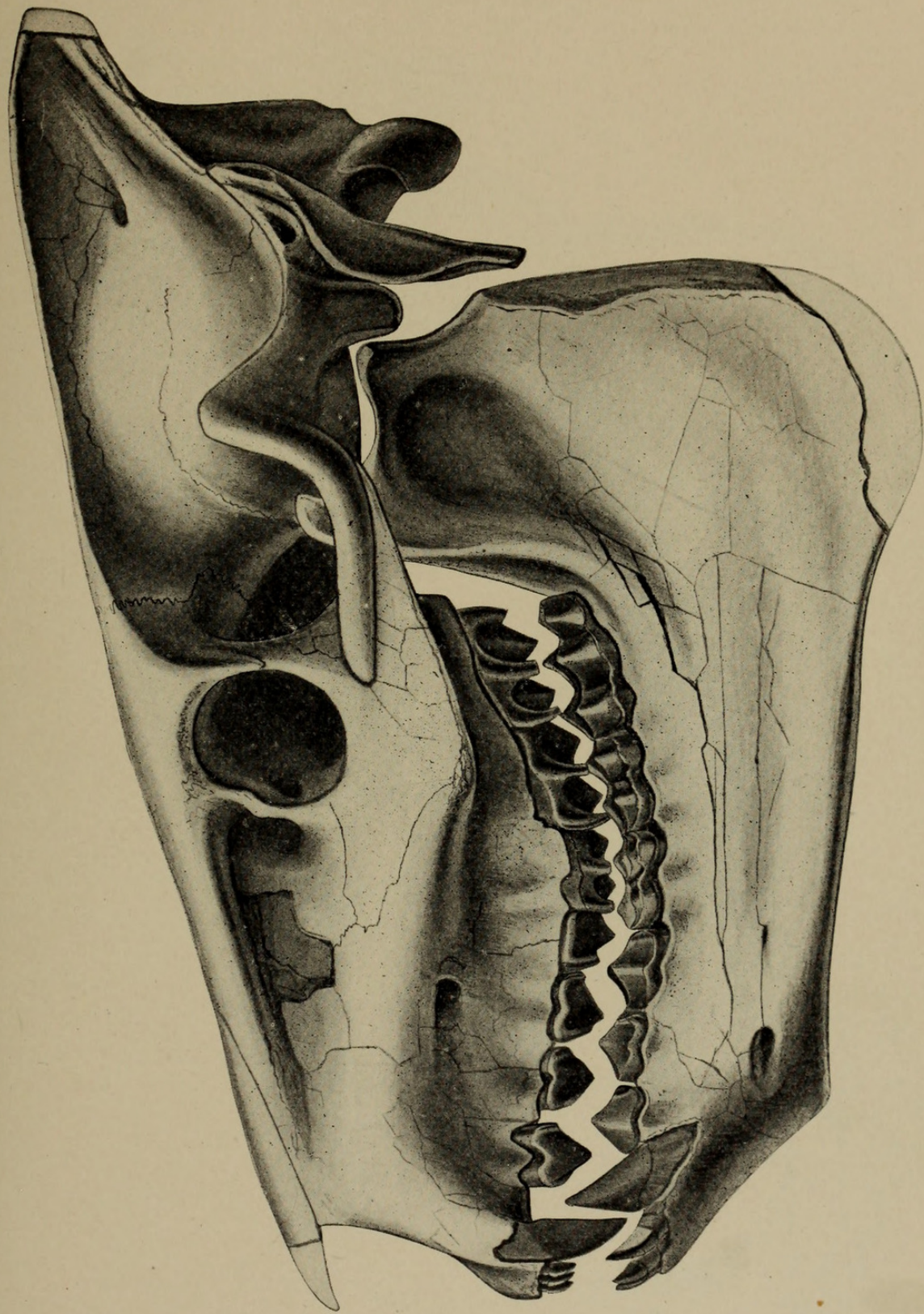
	mm.
Length of skull, greatest.....	.291
Length of skull, basal measurement.....	.280
Depth of skull, including angle of mandible.....	.190
Length of molar-premolar series.....	.145
Length of premolar series.....	.069
Length of molar series.....	.076
Length of last molar.....	.035
Height of last molar.....	.016

Promerycochærus grandis sp. nov.

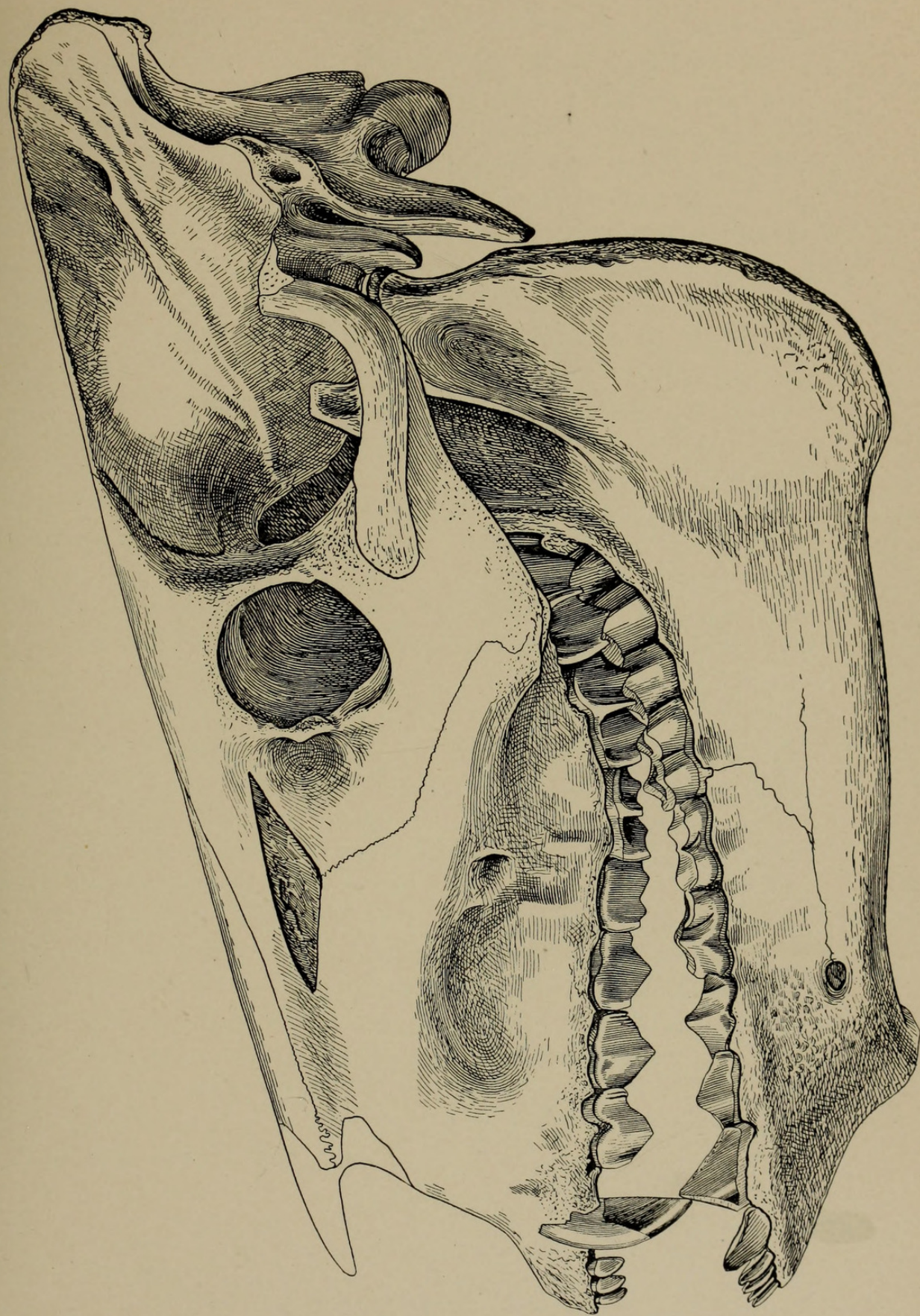
(PLATE XXVII.)

(Type No. 990, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type which was collected by the writer in 1902, includes a skull with mandible, cervical and lumbar vertebræ, a femur, a



Promerycocherus hatcheri Douglass (Type), $\frac{1}{2}$.



Promerycocherus grandis Douglass (Type), $\frac{4\frac{5}{8}}{100}$.

humerus, portions of a scapula, a radius, an ulna, a pelvis and a tibia. From the Cañon Ferry Beds (Middle or upper Miocene) at Cañon Ferry on the Missouri River about twenty miles east of Helena, Montana.

The species is one of the largest of the family. The skull is of the long and narrow type; the face is long and narrow; the upper line of the skull is nearly straight; the sagittal crest is quite high, but not heavy; the occiput overhanging; the brain-case is comparatively small; the posterior portion of the occiput is pillar-like, with two deep lateral concavities. The tympanic bullæ, though inflated, are not large in proportion to the size of the skull. The paroccipitals are high, their longest diameter is in a postero-internal and antero-external direction, and they lie posterior to the outer portion and external to the posterior portions of the tympanic bullæ against which they are closely pressed, they also come near to the high post-glenoid processes. The external auditory meatus is closely compressed between these two processes and has a flattened wing which is suturally united with the post-glenoid process on its posterior surface near its base. The basi-cranial axis is steeply inclined. The posterior angle of the zygomatic arch is not heavy or high; the anterior process of the squamosal is comparatively slender, but the malar beneath the orbit is deep. A broad convex ridge extends from the anterior portion of the arch to the posterior upper portion of the anterior nares; below this the face is somewhat concave. The mandible is long and the chin convex. One of the most peculiar characters of this animal is what appears to be an enormous enlargement of the fossa, usually small, which occurs on the anterior portion of the ascending ramus of the mandible above, and posterior to the last molar tooth. This fossa is deep, as well as large, and has for its posterior boundary a plate of bone separating it from the masseteric fossa which it has almost crowded out of existence. All the teeth are large, heavy, and closely crowded; in fact I know of no other member of the family with such strong dentition. The teeth have some peculiarities which there is not space at present to describe. The skeleton is not as robust as that of *Promerycochærus hollandi*, although the skull is larger.

MEASUREMENTS.

	mm.
Total length of skull.....	390
Length of upper dental series.....	213
Width of skull just anterior to glenoid articular surface.....	180
Height of skull at posterior of M ³	100

Length of molar-premolar series.....	168
Length of premolar series.....	82
Length of molar series.....	96
Length of neck.....	260
Length of femur.....	250

Promerycochærus hollandi sp. nov.

(PLATE XXVIII.)

(Type No. 1194, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type, which was collected by the writer in 1902, consists of the greater portion of a skull with a nearly complete mandible, a humerus, the cervical vertebræ, the great portion of a front foot, and a hind limb including the pelvis. From the Cañon Ferry Beds (Middle Upper Miocene) at Cañon Ferry, about twenty miles east of Helena, Montana.

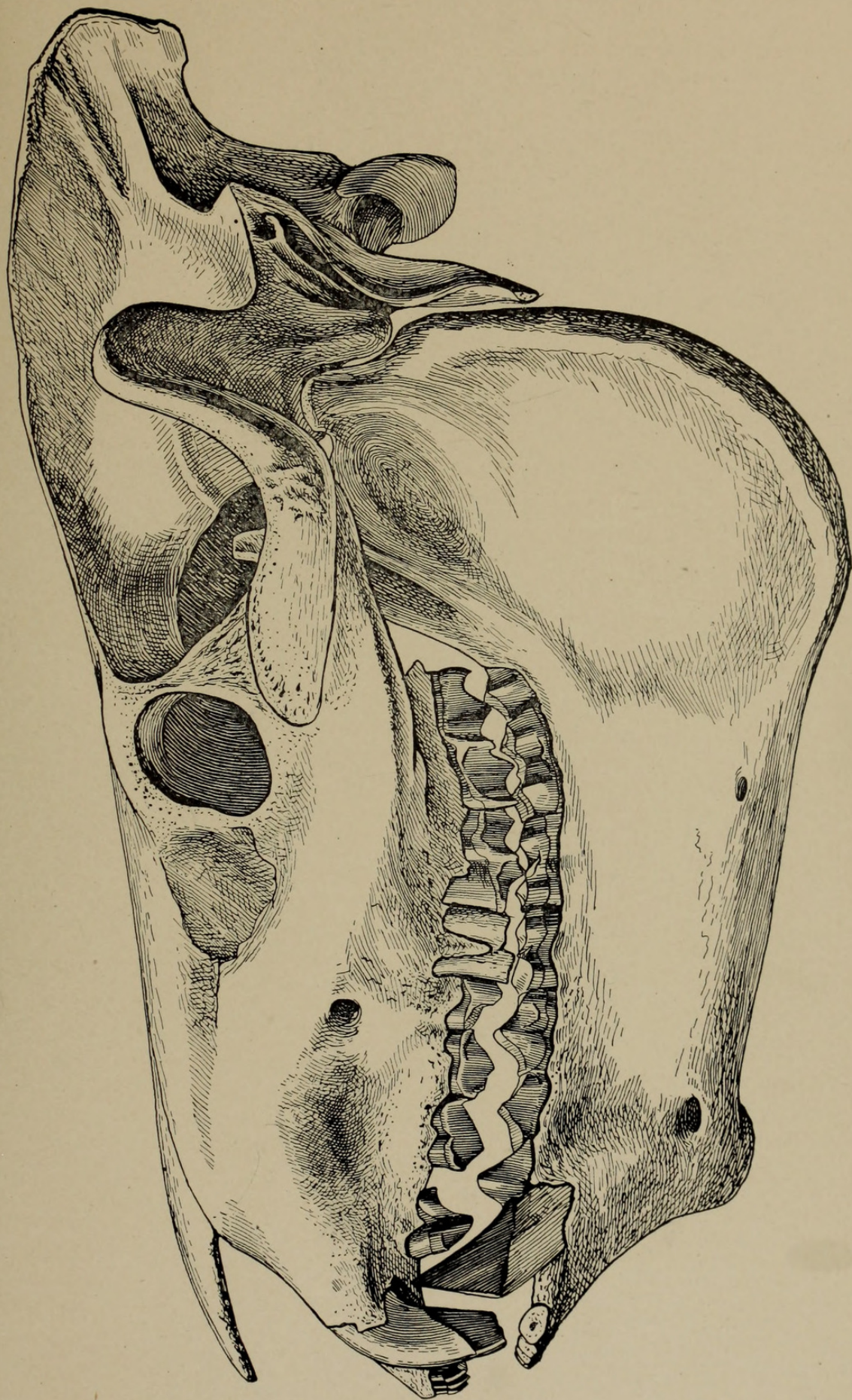
Size large; skull rather heavy and broad; posterior portion of zygomatic arches fairly heavy and turned upward; bones of skeleton heavier than in *Promerycochærus grandis*; anterior teeth not large; horizontal ramus of mandible rather deep and anterior fossa on ascending ramus large, but not so large as in *Promerycochærus grandis*.

Most of the above characters are those which distinguish this species from *Promerycochærus grandis*. There is little difference in the actual basal measurements of the skulls of the types of the two species, but the skull of *P. hollandi* is broader, not so high, and the zygomatic arches are more widely expanded; the teeth in *P. hollandi* are not so large and strong, and the anterior fossa on the ascending ramus of the mandible is not nearly so large. The limbs are nearly the same in length in the two species, but are heavier in *P. hollandi*.

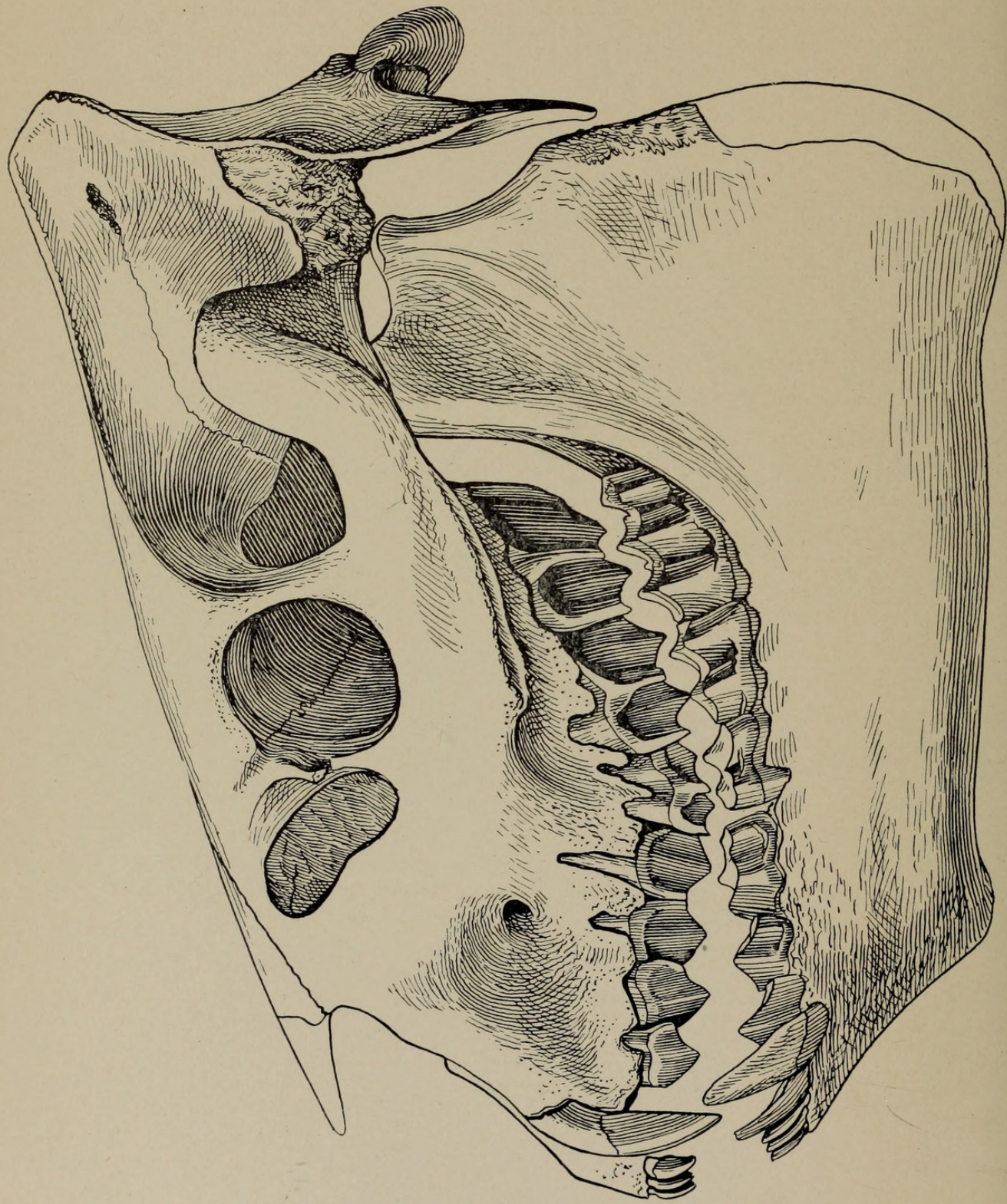
Named in honor of Dr. Holland, the Director of the Carnegie Museum.

MEASUREMENTS.

	mm.
Length of skull.....	342
Length of neck.....	250
Width of skull.....	234
Length of lower molar-premolar series.....	176
Length of lower premolar series.....	81
Length of lower molar series.....	95



Promerycochærus hollandi Douglass (Type), $\frac{1}{2}$.



Ticholeptus breviceps Douglass (Type), $\frac{3}{4}$.

Ticholeptus breviceps sp. nov.

(PLATE XXIX.)

(Type No. 1191, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type, which was collected by the writer in 1903, consists of a skull, mandible, left humerus, left radius and ulna, right radius and part of the right humerus, a tibia, a fibula, a tarsus with two metatarsals, greater portions of the pelvis, and the right manus with several metacarpals and phalanges.

This specimen was found enclosed in a nodular mass in deposits composed of gravel and cream-colored sands, about one mile southeast of Woodin on Divide Creek six or seven miles south of the Continental Divide in Silver Bow County, Montana.

The skull is short and broad and the facial portions rather high, though the frontal plane is nearly flat. The teeth, especially the posterior molars, are hypsodont. The molar series is much longer than the premolar, the second and third molars being longer than the four premolars. The anterior narial border rises steeply above P^1 . The premaxillaries are coössified for a distance of 1.4 cm. The superior portion of the narial opening is large and rounded. The infraorbital foramen is above the anterior portion of P^4 . Apparently there were preorbital vacuities. The posterior portion of the skull has a flattened appearance; the paroccipital processes are broad transversely, thin antero-posteriorly, convex behind and concave in front. The tympanic bullæ are lost, but apparently they were extremely large.

The anterior teeth in the mandible are crowded. The length of the lower premolar series equals the combined length of the first two molars and the anterior lobe of the third. The horizontal ramus is only moderately deep, the angle large, and the upper part of the ascending ramus not very broad antero-posteriorly.

The limbs and feet are short, but not heavy. They are about the same length as those of *Merycoidodon culbertsoni*. The skull is shorter, broader, and higher than in that species.

MEASUREMENTS.

	mm.
Length of skull at base.....	196
Width of skull including zygomatic arches.....	138
Height of skull above and including M^2	82
Length of upper molar-premolar series.....	101
Length of upper premolar series measured along alveolar border.....	43

Length of upper molar series measured along alveolar border.....	61
Length of lower molar-premolar series.....	110
Length of lower premolar series.....	46
Length of lower molar series.....	64

The specific name is given on account of the short skull.

***Ticholeptus bannackensis* sp. nov.**

(PLATE XXX.)

(Type No. 995, Carnegie Museum Catalogue of Vertebrate Fossils.)

The type, which was collected by the writer in 1903, consists of a portion of the anterior upper part of the skull, a mandible, and the greater portion of a skeleton. There is also a part of another skeleton (No. 1185), but no complete skull. Both specimens were taken from beds, which are undoubtedly of Miocene age, on Grasshopper Creek about ten miles above Bannack in Montana.

The portion of the skull which is preserved shows that the anterior nares were large, broad, and well rounded above. They are situated far back. This imparts to the face an appearance somewhat similar to that of *Merycochærus*. It is uncertain whether or not the nasals were much shortened anteriorly. They are broad at the posterior border of the anterior nares and narrow rapidly backward, terminating above the anterior portions of the orbits.

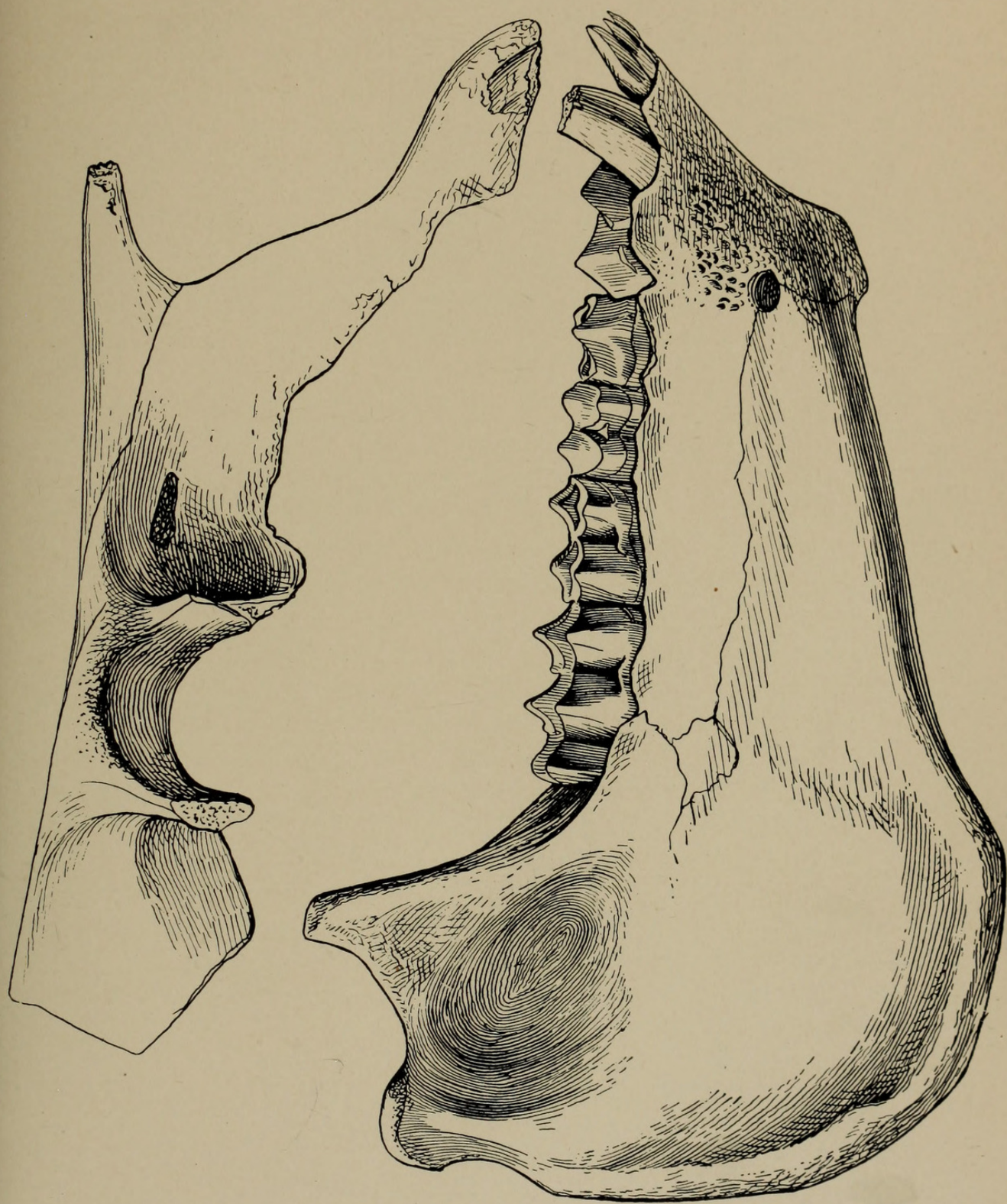
The mandible is deep and the angle broadly rounded. The chin is sloping and concave above the angle. The horizontal ramus increases in depth from beneath $P_{\frac{3}{4}}$ to below the middle of $M_{\frac{3}{4}}$ where the angle begins.

The teeth are hypsodont. The faces of the inner crescents of the last two upper molars are concave vertically. The length of the premolar series is a little less than that of the last two molars, and a little more than that of the first two molars and the anterior lobe of the third.

Compared with other species the limbs are intermediate in length, fairly robust. The cuboid is unusually high for its width.

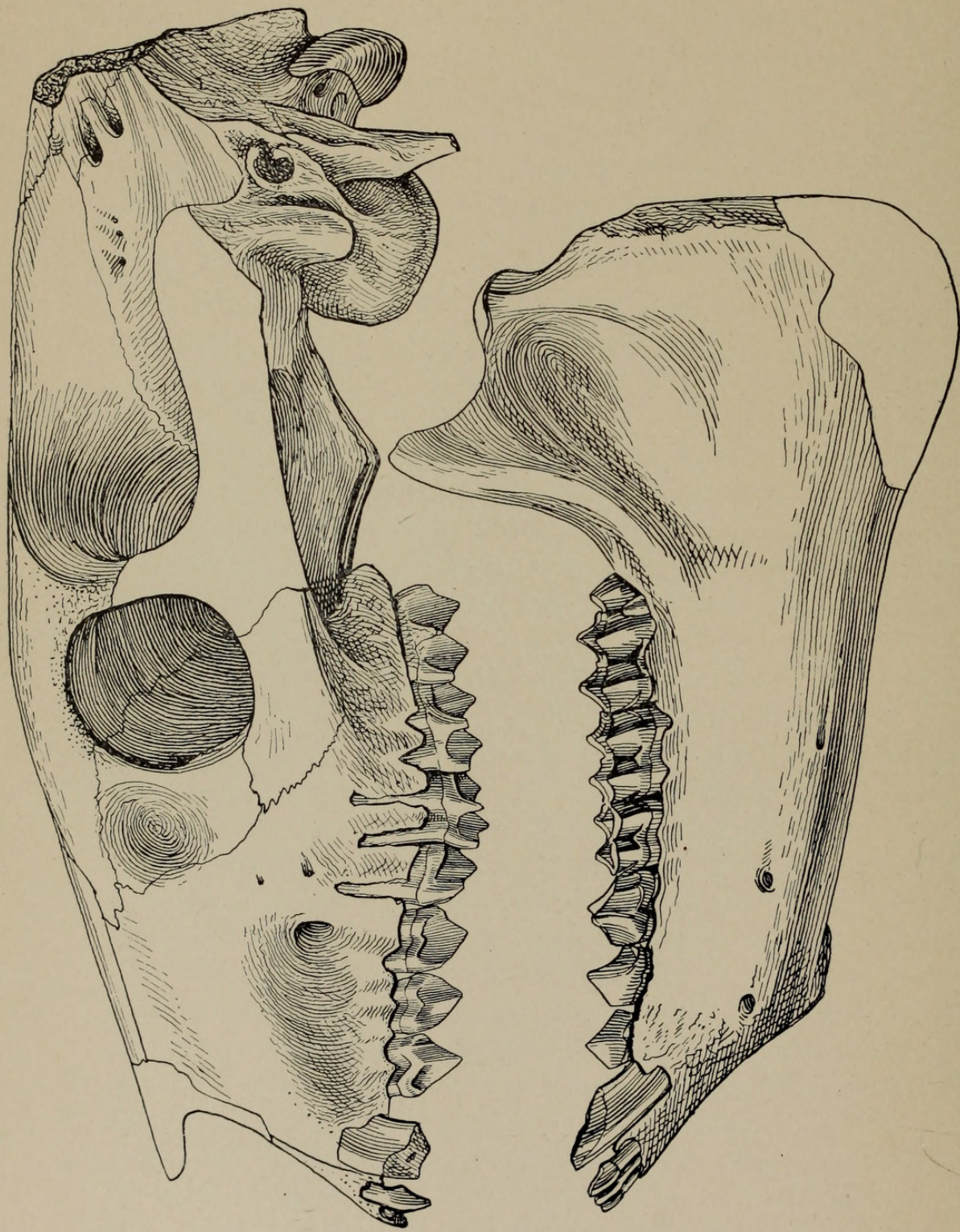
MEASUREMENTS.

	mm.
Length of mandible.....	217
Depth of mandible beneath $P_{\frac{3}{4}}$	41
Depth of mandible beneath middle $M_{\frac{3}{4}}$	54
Depth of mandible at coronoid process.....	128
Length of lower dental series.....	144



Ticholeptus bannackensis Douglass (Type), $\frac{2}{3}$.

Length of lower molar-premolar series.....	125
Length of lower premolar series.....	55
Length of lower molar series.....	70
Length of radius.....	155
Length of metacarpal III.....	71
Width of shaft of metacarpal III.....	12
Length of femur, head to distal end.....	205
Length of tibia.....	175
Height of cuboid.....	22
Width of cuboid.....	17
Length of metatarsal III.....	73
Width of metatarsal III.....	13
Named after the old mining towns of Bannack.	



Eucrotaphus dickinsonensis Douglass (Type), $\frac{2}{4}$.



Douglass, Earl. 1907. "Some new Merycoidodonts." *Annals of the Carnegie Museum* 4(2), 99–109. <https://doi.org/10.5962/p.328720>.

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