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SECOND CONTRIBUTION

TO A

KNOWLEDGE OF THE MIOCENE FAUNA OF OREGON.

BY E. D. COPE.

(Read before the American Philosophical Society, Dec. 5, 1879.)

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Second Contribution to a Knowledge of the Miocene Fauna of Oregon. By E. D. Cope.

(*Read before the American Philosophical Society, December* 5, 1879.)

Two contributions to the present subject have been heretofore made by the writer, viz., in the Proceedings of the American Philosophical Society, for November, 1878; and in the Bulletin of the U. S. Geological Survey of the Territories for February, 1879. In the latter article thirty-eight species of vertebrata were enumerated as having been discovered in the Truckee beds of the White River formation of Oregon, of which all but one were mammalia.

I have since conducted explorations in that region, the expeditions being mostly under the direction of Jacob L. Wortman. This gentleman has obtained a great many specimens, several of which indicate new species, which it is the object of the present article to describe. In addition to these discoveries, Mr. Wortman has sent remains of *Lacertilia* and *Ophidia*, orders previously unknown in Oregon. I had discovered them in the White River formation in Colorado in 1873.

HESPEROMYS NEMATODON, sp. nov.

This rat is represented by a beautiful skull, discovered by Prof. Thomas Condon, of Eugene city, and by several jaws, and other fragments subsequently found by Mr. Wortman.

The frontal region is not contracted as in *Eumys elegans* and *Fiber zibethicus*, but the superciliary ridges are well separated from each other, as in *Hesperomys americanus*. The frontal and posterior nasal regions are slightly concave in transverse section. The molars display tubercles on one side, and crescents on the other, the former being external in the superior series. The first superior molar has an additional tubercle at its anterior extremity. The incisors have a transverse anterior face, which is divided by several delicate ridges.

Length of superior molar series, .0065; length of first superior molar, .0028; interorbital width, .0042. Length of inferior molar series (specimen No. 2), .0064; length of first molar, .002; width of incisor, .001; depth of ramus at second molar, .004.

SCIURUS VORTMANI, sp. nov.

Like the *S. relictus*, of the Colorado White River beds, this is a rare species, being only represented by a mandibular ramus in my collection. This part is remarkable for its depth as compared with its length; and the base of the coronoid process has an anterior position. It rises opposite the posterior part of the third molar, and its anterior border descends to a point just below the posterior part of the first molar. The inferior border of the masseteric fossa is a prominent edge, which descends below the inner inferior margin of the ramus. The molars diminish regularly in size forwards; their crowns are basin-shaped, with the anterior angle of the ex-

ternal border elevated, and the inner border notched medially. Incisor compressed.

Length of inferior molar series, .010; antero-posterior diameter of first molar, .0024; length of fourth molar, .003; depth of ramus at diastema, .0055; depth at third molar, .0095.

This species is considerably larger than the *S. relictus*. It is dedicated to Jacob L. Wortman, of Eugene, Oregon, a successful explorer of the paleontology of that State.

PACICULUS INSOLITUS, gen. et sp. nov.

Char. gen. Superior molars three, rooted. Enamel forming three entrant loops on the external face of the crown, and one on the internal face.

While the number of the superior molars of *Paciculus* is as in the *Muridæ*, the details of their structure is much as in *Dasyprocta* and *Steneofiber*. But one species is known.

Char. spec. Size small. Molars regularly and rapidly diminishing in size posteriorly. Inner enamel loop turned forwards; the external straight and transverse, excepting in the first molar, where the anterior column of the tooth is extended forwards, and the anterior loop is turned backwards.

Length of superior molar series, .006; length of first molar, .0021; width of first molar, .0018; length of third molar, .001.

CANIS LEMUR, sp. nov.

This species is represented by several crania in my possession. It is the smallest of the genus yet discovered in the Miocene formation of Oregon. It is characterized by the contracted proportions of the muzzle, the width of the front, and the large size of the eyes. The postorbital process is only a short angle. The superior border of the temporal fossa is traceable from the postorbital process. Those of opposite sides embrace a smooth sagittal area of an elongate urceolate form, and unite posteriorly in a very short crest. The species is further characterized by the large size of the first superior tubercular molar, which with the second, has a distinct inner cingular border, and median tubercle. The superior sectorial is short, and its inner cusp is anterior.

Some mandibles probably belonging to this species exhibit posterior cutting lobes on the third and fourth premolars. The blades of the sectorial are very short, and the heel large and wide. The tubercles of the tubercular are large.

Length of cranium to front border of orbit, M. .0525; elevation of occiput, .058; length of superior sectorial, .007; length of first tubercular, .0058; width of first tubercular, .0078; width of second tubercular, .005; length of second tubercular, .0035; interorbital width of second specimen, .0056; length of inferior dental series, .048; length of sectorial, .008; length of heel of sectorial, .0035; length of inferior tubercular, .055; depth of ramus at sectorial, .0105.

This species is smaller than *Canis gregarius*, and differs from both it and the C. *cuspigerus* in the larger orbits, more contracted muzzle, and in the distinct superior border of the temporal fossa, etc.

The dog which I referred to the genus *Enhydrocyon* (Cope) under the name of *E. basilatus*, probably belongs to another genus. Portions of the maxillary bone present the dentition of *Icticyon*, viz., P-m. 4, M. 1, thus differing from *Enhydrocyon*, which possesses P-m. 3; M. 2. As there are but three premolars in the inferior series, this species cannot be referred to *Icticyon*, but must be accepted as typical of a new genus. This I propose to call *Hyænocyon*. It resembles *Hyæna* more nearly than any genus yet discovered in North America, but probably belongs to the *Canidæ*.

AMPHICYON ENTOPTYCHI, sp. nov.

This rather small species is represented by a skull which lacks the extremity of the muzzle and the mandible, and has its parietal region crushed.

The superior premolar teeth are rather short in anteroposterior diameter, while the tubercular molars are relatively large. There are no posterior lobes on the former; the internal and external cingula are well developed in the first and second of the latter. The third tubercular is about as wide as the second is long. The sagittal crest is only distinct on the posterior part of the parietal region. Estimated length of skull, M. .110; length of superior molar series, .041; length of true molar series, .016; length of first tubercular, .0075; length of second tubercular, .055; width of second tubercular, .0074; length of third tubercular, .0036; width of third tubercular, .052: Length of sectorial width between anterior external angles of first tuberculars, .030.

The teeth of this species are about half the size of those of *A. vetus* Leidy.

ARCHÆLURUS DEBILIS Cope.

American Naturalist, 1879, p. 798*a*, December.

Char. gen. Dentition, I. $\frac{3}{3}$; C. $\frac{1}{1}$; P-m. $\frac{4}{3}$; M. $\frac{1}{2}$; mandible with the anterior face of the symphysis separated from the lateral face by an angle which is not produced downwards. Superior sectorial without anterior lobe; inferior sectorial with heel. The characters place *Archælurus* at the base of the *Felidæ*, showing that it is the most generalized form yet known, and about equally related to the feline and Machærodont series.

Char. specif. General structure of the jaws weak. Superior canine small, little compressed, with an acute posterior edge which is not serrulate. First premolar in each jaw one-rooted; second inferior premolar large; sectorials large, diastemata very short. Alveolar border below the inferior sectorial and tubercular teeth everted, forming a large osseous callus, which has a free inferior and posterior margin, the latter rising into the base of the coronoid process. Zygomata slender; postorbital processes little prominent; front wide, convex transversely.

Length of cranium, M. .200; superciliary width, .052; zygomatic width, .124; length from orbit to superior incisors, .066; length of superior sectorial, .023; length of inferior molar series, .064; diameter of superior canine, .012. About the size of the panther, or of the *Nimravus brachyops*.

The osseous callus below the true molars is a remarkable character, unique in the order of *Carnivora*. It is evidently a provision against the weakness of the mandibular rami, at the point of greatest strain.

HOPLOPHONEUS PLATYCOPIS Cope.

American Naturalist, 1879, p. 798*b*, December.

This is the largest sabre tooth discovered in North America. It was twice the bulk of the *H. primævus* Leidy, and differs from that species and the *H. occidentalis* in the relatively larger size of the premolar teeth, which are less obliquely placed than in the latter. The first superior premolar is very small. The canine is large and compressed as in the species of *Machærodus*, and has serrulate posterior and anterior cutting edges. Inferior incisors with conic crowns. The symphysis is very deep in consequence of the large development of the inferior flares for the canines. Sagittal crest making a steep angle with the front.

Total length of cranium, M., .280; zygomatic width, .192; length from orbit to superior incisors, .095; length of inferior sectorial, .025; of inferior sectorial, .022; length of inferior molar series, .055; length of crown of superior canine, .060; width of superior canine at base, .026. This skull is less than one-sixth smaller than that of the Bengal tiger (*Uncia tigris*).

CHÆNOHYUS DECEDENS, gen. et sp. nov.

The characters of this genus will be best understood by comparison with those of the two other genera of suilline animals which occur in the same formations.

Premolars three, a wide diastema between the anterior one and its successor..... *Chænohyus.*
Premolars four; diastemata before and behind the first... *Thinohyus.*
Premolars four, in a continuous series..... *Palæochœrus.*

It is then apparent that *Chænohyus* differs from *Dicotyles* in having the diastema behind the anterior premolar instead of in front of it.

Char. spec. This hog is represented in the collection of Prof. Condon at Eugene City, Oregon, by the anterior part of a cranium, which includes both maxillary bones. Its size is a little less than that of the *Dicotyles torquatus*. The series of maxillary teeth is slightly convex externally, and the teeth diminish rapidly in size anteriorly. The difference in dimensions between the first and last true molars is much greater than in the other suillines of this period known to me. The external tubercles of the true molars are somewhat flattened externally, and a distinct cingulum passes entirely round their external bases. The first superior premolar has one root, the other premolars possess two.

I suspect that the *Dicotyles hesperius* of Marsh belongs to *Chænohyus*. It differs from the *C. decedens* in its materially smaller size. According to Marsh, it is considerably smaller than his *Thinohyus socialis*, which is about as large as the *C. decedens*.

Discovered by Prof. Condon in the region of the John Day river.

THINOHYUS TRICHÆNUS, sp. nov.

Represented by the greater part of the maxillary and mandibular bones of both sides, with teeth.

There is a diastema behind the second inferior premolar, about equal in

extent to that in front of it, which is twice as wide as the one in front of the first premolar. The first and second premolars have but one root, while the two others have two. The first superior premolar is close to the canine, and has but one root; it is separated by a diastema from the second. The latter has one root, and is near the third, which has two roots. The third and fourth superior premolars have each one compressed external, and one internal lobe. That of the third is lower and is pressed against the external. It is continued as a ridge posteriorly, enclosing a shallow basin with the external tubercle.

The true molars of both jaws have the intermediate tubercles well developed. The external tubercles of the superior molars are not flattened, and have a low cingulum surrounding their bases. Surface of enamel nearly smooth. Length of true molar series of upper jaw, M. .046; of last superior molar, .017; width of do., .013. Diameter of first true molar,—anteroposterior, .012; transverse, .011. Length of posterior three premolars along base, .028; of diastema, .011. Length from inferior canine to third inferior premolar, .028; length of diastema anterior to second premolar, .008; do. of diastema posterior to second premolar, .007.

This is the species I formerly called *Palæochœrus condoni** Marsh (*Platygonus* Marsh). That species belongs to the Loup Fork fauna, and not to the present one. Some teeth which probably pertain to it in Prof. Condon's collection, exhibit the peculiarity of not possessing any basal cingula on the molars of either jaw.

From the fact that Pomel† implies that some of the species of *Palæochœrus* present a diastema, I have referred the *Thinohyus* of Marsh to it as a synonym.‡ Pomel's genus was, however, established on a species (*P. typus*) which has no diastema, hence *Thinohyus* is probably to be preserved.

This species is about the size of the *Thinohyus lentus* of Marsh, and agrees with his descriptions in several respects. There appears, however, to be a material difference between the specimens in the relations of the inferior premolars. Marsh describes a much more considerable diastema in front of the first premolar, and does not mention the one behind the second premolar. I am acquainted with a second species of the genus of about the same size, in which there are but two diastemata, viz., one before and one behind the first premolar, and I suppose this one to resemble the *T. lentus*. Specimens of this character are in my collection, and I have seen one in that of Prof. Condon.

PALÆOCHŒRUS SUBÆQUANS, sp. nov.

This suilline is represented by an entire cranium which was discovered by Prof. Condon. It indicates a species of the size of the *Dicotyles torquatus*, and smaller than the *Thinohyus trichœnus*.

The first true molar is not disproportionately smaller than the third; and there is a distinct cingulum at the external base of the superior true molars.

* Bull. U. S. Geol. Surv. Terrs., 1879, V, p. 58.
† Catal. Vertebr. Foss. Basin Loire, 1853, p. 86.
‡ Bull. U. S. Geol. Surv. Terrs., 1879, V, p. 44.

The external faces of the external tubercles of these teeth are somewhat flattened. The first premolar has one root, the others have two. They are equidistant and not very closely crowded.

Several suillines are described by Marsh and Leidy, either imperfectly or from imperfect material, so that I have had some difficulty in determining my specimens. The *D. hesperius* of Marsh is probably, as above observed, a *Chænohyus*. I have specimens agreeing with Marsh's description of *Thinohyus socialis*. They belong to an animal of the size of the *Chænohyus decedens*, but the superior molars have no basal cingulum. Its generic position is yet uncertain. Other specimens agree in characters with the *Dicotyles pristinus* of Leidy, with which *Thinohyus lentus* of Marsh agrees in size. In this hog there is no diastema in front of the third inferior premolar, so that it is clearly distinct from the *Thinohyus trichænus* of the present paper.

MERYCOPATER GUIOTIANUS Cope.

Having obtained several crania of this species, I can give the characters of the genus *Merycopater* * more fully than hitherto. Dentition; I. $\frac{1-2}{3}$; C. $\frac{1}{1}$; P-m. $\frac{4}{4}$; M. $\frac{3}{3}$. A diastema above and below; fourth superior premolar with two external crescents; fourth inferior premolar identical in form with first true molar; the first inferior premolar functionally the canine. Orbit open posteriorly; no facial fossæ or vacuities.

This genus is *Agriochærus*, with a considerable diastema, and very much reduced superior premaxillary teeth. In my best preserved cranium there is no alveolus for the first; that of the second is rudimental, and that of the third is small. The premaxillary bones are very small and distinct from each other. The enlargement of the cingula represents the posterior internal tubercle of the fourth superior premolar, so distinct in *Coloreodon*.

The deficiency in superior incisors is an interesting approximation to true ruminants not heretofore observed in *Oreodontidæ*. I have found the inferior incisors deficient in the genera *Cyclopidius* and *Pithecistes*.

COLOREODON FEROX, gen. et sp nov.

Char. gen. Dentition, I. ?; C. ^{1}; P-m. ^{3}; M. ^{3}; a wide diastema above; the first inferior premolar functionally the canine. Last superior premolars with two external and two internal crests Orbit open posteriorly; no facial fossæ or vacuities. The genus differs from *Agriochærus* in the wide diastemata, presence of but three superior premolars, and two inner tubercles of the fourth premolar.

I possess two species of this new genus, which are represented in my collection by crania without premaxillary bones and mandibles.

Char. specif. Size of *Oreodon culbertsoni*. Maxillary bone excavated above the diastema, the superior border of the concavity extending nearly to the base of the zygoma. Zygomatic arches expanded, their external face concave below the orbit, and plane posteriorly. Saggittal crest very high, dividing anteriorly into two ridges, which diverge widely, and

* Cope, *American Naturalist*, 1879, p. 197.

terminate at a point opposite the postfrontal process. The space enclosed in their angle is plane. Space between supraorbital foramina convex.

The posterior internal tubercle of the fourth premolar is much smaller than the anterior; the inner basal tubercles of the second and third are subposterior and acute. The length of the diastema is equal to that of the premolar series. The enamel of the molars is wrinkled. The canines are robust.

Estimated length of skull, M. .200; length of superior molar series, .066; of diastema, .028; diameters of second true molar, — anteroposterior, .016, transverse, .017; width of palate at do., .033; interorbital width, .060.

The strongly developed crests and wide zygomata of this animal, together with the large canine teeth, evidently indicate that it was a formidable antagonist even for the *Carnivora* of its time.

Discovered by Charles H. Sternberg.

COLOREODON MACROCEPHALUS, sp. nov.

This Oreodont is considerably larger than the *O. ferox*, being of the size of the *Eucrotaphus major*, while the former equals the *Oreodon culbertsoni*. It also differs from its congener in the relatively longer and narrower frontal region. The sagittal crest is elevated, and divided into two crests opposite the posterior part of the zygomatic fossa. These branches are nearly straight, and diverge at an acute angle, terminating above the postorbital processes. They enclose a deep concavity, which is continuous with the front anteriorly. In *O. ferox* these crests diverge much more abruptly and widely from a more anterior point, and enclose a much smaller concavity. The supraorbital foramina are close together and are separated by a small protuberance of the middle line. The parietal walls of the temporal fossa are rugose. The posterior tubercle of the fourth premolar is well developed, while a single tubercle is present on the preceding premolar.

Length of cranium from inion to above superior canine, M. .230; length from superior canine postorbital angle (axial), .124; length from junction of crests to supraorbital foramina, .060; interorbital width, .072; length of bases of the molars except the last, .050; length of three premolars .027. Length of diastema, .030.

From the North Fork of John Day River; found by J. L. Wortman.

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