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OF EASTERN OREGON**

By **CHESTER STOCK**

With one platé and two text-figures

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With the exception of the three species, *Tephracyon rurestris* (Condon), *Canis* sp. and Cope's type *Lutricitis? lycopotamicus* no other carnivores have been recorded from the Mascall Miocene of the John Day Valley, Oregon, as a result of further collections obtained from these deposits since the earlier explorations in this area. During the past summer a field party from the California Institute of Technology was fortunate in securing the remains of two carnivores new to the Mascall assemblage. While the material is incomplete, records of these types are of interest and may be of significance in establishing a more accurate correlation of the Mascall fauna with Tertiary assemblages known from regions lying beyond the John Day Basin.

Leptarctus oregonensis n. sp.

Type specimen—No. 206 C.I.T. Coll. Vert. Pale. representing fragments of a skull including portions of the palate with P₄ and M₁ (Plate 1, figures 1a, 1b and text-figures 1 and 2).

Specific characters—Smaller than neotype of *Leptarctus primus*. External cingulum prominent in P₄ and M₁. Cuspule present on cingulum of M₁ opposite notch between paracone and metacone. Slight elevation of enamel surface posterior to protocone in M₁.

Locality—Exposures of Mascall deposits north of the east fork of the John Day River, approximately 1.5 miles northwest of Dayville, Oregon. Specimen collected by S. W. Lohman.

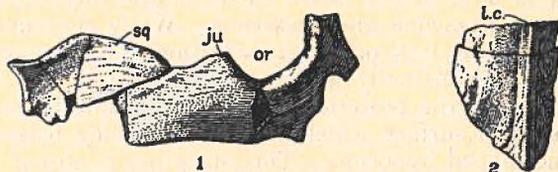


FIG. 1—*Leptarctus oregonensis*, n. sp. Portion of right zygomatic arch, No. 206 C.I.T. Coll.; outer view; x 1.0 or, orbit; ju, jugal; sq, squamosal.

FIG. 2—*Leptarctus oregonensis*, n. sp. External surface of fragment of cranial wall showing portion of lateral temporal crest (lc.); No. 206 C.I.T.; x 1.0.

Mascall Miocene, John Day Valley, Oregon.

Description—Reference of the Mascall specimen to the genus *Leptarctus* is clearly indicated by the superior dental formula and by the characters of P₄ and M₁. Comparison of No. 206 with the nearly complete skull described by Matthew¹ from the lower Snake Creek beds and referred to Leidy's species *L. primus* establishes the following points of similarity:

¹ W. D. Matthew, Bull. Amer. Mus. Nat. Hist., vol. 50, pages 138-146, figs. 37-38, 1924.

(1) The superior dentition in No. 206 lacks the first premolar and the second molar.

(2) P₄ possesses in addition to the paracone, metacone and protocone, a fourth cusp present on the inner side of the crown behind the protocone.

(3) M₁ with well-defined paracone and metacone. Summit of protocone is continuous with a ridge which swings forward and outward along the front of the base of the paracone. Postero-internal crescent formed by hypocone.

(4) Presence of a relatively heavy zygomatic arch (fig. 1).

(5) A lateral and well-defined temporal crest is present (fig. 2).

In the Mascall specimen the two posterior teeth are completely preserved. Alveoli indicate the position of I₃, C, and the two premolars. P₂ and P₃ were each two-rooted and appear to have been slightly more crowded than in the Snake Creek form. The anterior root socket of P₂ is slightly farther behind the alveolus for the canine in the Oregon specimen than in No. 18241 Amer. Mus. from Nebraska.

P₄ is very similar to the comparable tooth in Matthew's specimen. The paracone is the prominent external cusp with the shearing blade of the metacone less distinct and prominent. As noted by Matthew the notch between paracone and metacone tends to disappear in *Leptarctus*. A cingulum is present along the anterior base of the paracone. The two inner cusps are cone-shaped, the larger one being the protocone. A ledge extends from the posterior end of the hypocone to the inner posterior end of the metacone.

M₁ is slightly longer than wide. An external cingulum is present, from which rises a tiny tubercle opposite the notch between paracone and metacone. An enlargement of the cingulum at the anterior end tends to form a rudimentary parastyle, while at the posterior end of the metacone is a rudimentary metastyle. The external cingulum is better defined in the Mascall specimen than in the neotype of *L. primus*, No. 18241 Amer. Mus. Coll., and there is no evidence in the latter of the tiny tubercle opposite the notch between paracone and metacone. While the small cuspule is absent in the latter, the lack of better definition of the external cingulum is possibly due to the distinctly greater wear of M₁ in this form than in the Mascall type. At the posterior base of the protocone is a slight elevation of the enamel surface which crosses the valley between this cusp and the crescent-shaped hypocone. This elevation is absent in the Snake Creek specimen. In No. 206 the antero-internal end of the hypocone is continuous with a narrow cingulum which extends along the inner and anterior sides of the protocone.

Available material of the skull in No. 206 is fragmentary. The side view of the snout is shown in Plate 1, figure 1b. The round infra-orbital foramen is of relatively large size and the antero-external rim of this opening is situated above the anterior end of P₄. A median section of the palate has been crushed inward but displays the maxillo-palatine suture. Fragments of the zygomatic process of the squamosal and of the jugal are shown in figure 1. In relative heaviness of zygomatic arch the Mascall specimen resembles closely that from the Snake Creek beds. The character of the fragment of the cranial wall shown in figure 2 clearly indicates that the temporal crest present on this piece is a portion of a lateral ridge. This ridge appears to be slightly heavier than in the neotype

of *Leptarctus primus*. The presence of double temporal crests is one of the peculiar features of *Leptarctus*.

Discussion—Little can be added to the available information regarding the relationships of *Leptarctus* from a consideration of this additional material. The structure and affinities of the genus were fully reviewed by Matthew on the basis of very complete skull remains from the *Merychippus paniensis* Zone of the Snake Creek deposits. Before comparisons were made with a cast of the palate and teeth of No. 18241 Amer. Mus. Coll., the writer was impressed by greater resemblance of the Mascall specimen to the Melinæ than to the Procyonidæ. More detailed comparison has tended to substantiate Matthew's opinion of the mustelid relationships of *Leptarctus*. The presence of the type in the Mascall extends considerably the known geographic range of *Leptarctus*.

Measurements in millimeters

	Mascall No. 206	Snake Creek No. 18241
Length from anterior end of canine alveolus to posterior end of M ₁	25	30
P ₄ anteroposterior diameter.....	6.2	6.7
P ₄ transverse diameter.....	4.9	5.3
P ₄ height of crown.....	4.1	
M ₁ anteroposterior diameter through middle of tooth.....	6.4	7.3
M ₁ transverse diameter.....	6.1	7

Amphicyon cf. sinapius Matthew

A fragmentary right ramus of the mandible, No. 207 Calif. Inst. Tech. Coll. Vert. Pale., Plate 1, figs. 2a, 2b, represents a large canid type found in the Mascall deposits of the John Day Valley by F. D. Bode. This specimen agrees in size and proportions with the lower jaw, No. 18258 Amer. Mus., described by Matthew¹ from the *Merychippus paniensis* Zone of the Snake Creek beds and referred to *Amphicyon sinapius*. No. 207 resembles the type of this species, No. 9358 Amer. Mus. Coll., in thickness of ramus and in size of M₁ and M₂. The cotype of *A. sinapius*, No. 9357 Amer. Mus. Coll., an unworn crown of the lower carnassial from the Pawnee Creek beds, also bears considerable similarity in size to the Mascall specimen.

No. 207 from the Mascall lacks the posterior and postero-inferior portions of the jaw and the dentition is incompletely preserved. The symphyseal area is broad and reaches back to a line descending between P₂ and P₃. A large mental foramen is situated below the anterior root of P₂. Its position is slightly farther posteriorly than in No. 18258. A second and much smaller foramen lies below the posterior root of P₃. The single incisor and canine are well worn and this type of wear characterizes also the first and second molars. Unfortunately in M₁ that portion of the tooth lying anterior to the heel is broken away.

The spacing of the premolars resembles that in Matthew's specimen referred to *Amphicyon sinapius*. The longest diastema between the premolars is that between P₂ and P₃. P₁ was perhaps a two-rooted tooth in which the roots were fused. A distinct posterior accessory cusp is in evidence in P₄. The heel of M₁ is broad with postero-external border angulate. While the heel is well worn, the surface relief of the dentine suggests the presence of a large external cusp as in amphicyonine forms.

¹W. D. Matthew, Bull. Amer. Mus. Nat. Hist., vol. 50, pages 104-111, fig. 21, 1924.

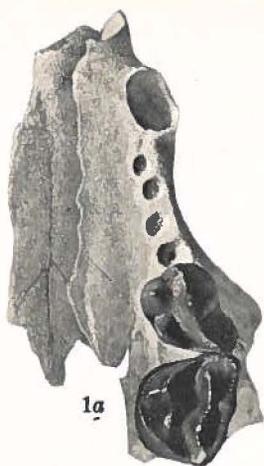
The proportions of $M\bar{2}$ appear to be similar to those in No. 18258 Amer. Mus. Coll.

Matthew has referred several specimens of the genus *Amphicyon* from the lower Snake Creek beds to *A. sinapius*. The latter species was described by Matthew¹ on the basis of a small fragment of a lower jaw with $M\bar{2}$ from the Pawnee Creek Middle Miocene of Colorado. It is a matter of some interest to record from the Mascall an amphicyonine type closely related to a species known from these Tertiary horizons of the Great Plains province.

Measurements (in millimeters) of No. 207

Length, anterior end of C to posterior end of $M\bar{2}$	170.8
Length, anterior end of $P\bar{2}$ to posterior end of $M\bar{2}$	119.3
I $\bar{3}$, transverse diameter.....	6.7
C, transverse diameter at base of enamel.....	15.4
$P\bar{2}$, anteroposterior diameter.....	11.6
$P\bar{2}$, transverse diameter.....	6.8
$P\bar{3}$, anteroposterior diameter.....	13.7
$P\bar{3}$, transverse diameter.....	7.3
$P\bar{4}$, anteroposterior diameter.....	19.4
$P\bar{4}$, greatest transverse diameter.....	10
$M\bar{1}$, anteroposterior diameter (approximate).....	35
$M\bar{1}$, greatest transverse diameter of heel.....	16.5
$M\bar{2}$, anteroposterior diameter.....	25.3
Depth of jaw at posterior end of symphyseal surface.....	45.7
Thickness of jaw at posterior end of symphyseal surface.....	19.3
Length of diastema between $P\bar{2}$ and $P\bar{3}$	11.1

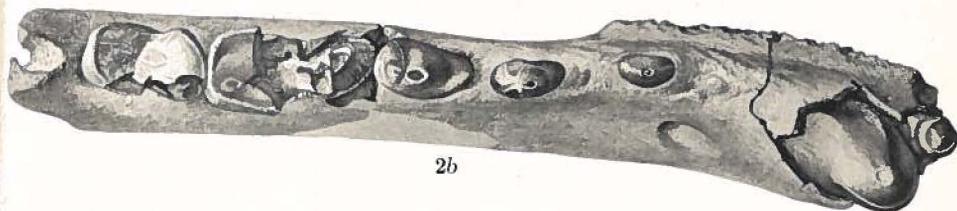
¹ W. D. Matthew, Bull. Amer. Mus. Nat. Hist., vol. 16, page 288, fig. 2, 1902.



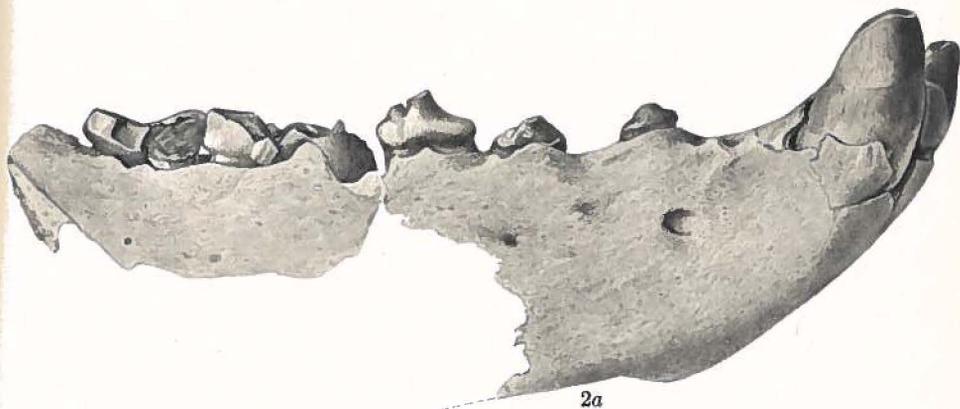
1a



1b



2b



2a

FIGS. 1a, 1b—*Leptarctus oregonensis*, n. sp. Fig. 1a, view of palate and occlusal view of P₄ and M₁; fig. 1b, lateral view; No. 206 C.I.T.; x 2.0. Mascall Miocene, John Day Valley, Oregon.

FIGS. 2a, 2b—*Amphicyon* cf. *sinapius* Matthew. Lateral and occlusal views; No. 207 C.I.T.; x 0.66. Mascall Miocene, John Day Valley, Oregon.