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Article VIII.—ON THE AFFINITIES OF LEPTARCTUS PRIMUS OF LEIDY.

By J. L. WORTMAN.

Up to the present time but very little has been known of the existence of the peculiarly American family Procyonidæ in any deposits older than the very latest Quartenary. Leidy has described and figured¹ an isolated last upper tooth, from the Loup Fork deposits of Nebraska, under the name of *Leptarctus primus*, which has been referred to this family. The Museum Expedition of last year into this region was successful in obtaining additional material, which we provisionally refer to Leidy's species.

Leptarctus primus *Leidy.*

The specimen consists of the right ramus of the lower jaw, carrying the third and fourth premolars and the canine. The condyle is broken away, but the coronoid process and the angle are preserved. The specimen is from a young individual in which the last premolar had just cut the gum. The alveoli of all the other teeth are present and in a good state of preservation.

The dental formula is as follows : I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{2}{2}$. The incisors are not preserved, but their alveoli indicate that they were much crowded, the outside one being placed almost directly in front of the canine, and the middle one pushed back considerably out of position. This series is in marked contrast with that of the Raccoon, in which the crowns of the incisors form almost a straight line across the jaw, and the middle one is crowded backwards to a very slight extent. The canine is peculiar and differs markedly from that of the Raccoon. It is rather robust, very much recurved and grooved by a deep vertical sulcus upon its antero-internal face. This sulcus is but faintly indicated in the Raccoon. The postero-external face of the crown is marked by a sharp ridge which becomes more prominent near

¹ Extinct Fauna of Dakota.

the apex. The first premolar is not preserved, but its alveolus indicates that it was a single-rooted tooth, placed behind the canine after the intervention of a very short diastema. The second premolar is bifanged; its crown is composed of a principal cusp, to which is added behind a small though very distinct second cusp. There is in addition to these cusps a distinct basal cingulum, most prominent in the region of the heel. The third premolar, like the second, is double rooted; its crown moreover is made up of two cusps, the posterior being almost as large as the principal one. These cusps do not stand in the line of the long axis of the jaw, but are placed very obliquely to it. The heel is not very prominent, but the basal cingulum is well developed, both in front and behind. As compared with the Raccoon, the second premolar is more complex in that it has two cusps instead of one. In the third premolar the posterior cusp is much better developed, and placed more obliquely than in the corresponding tooth of *Procyon*; the heel is moreover not so broad.

The first molar is not preserved, but judging from the size of its roots it was decidedly the longest tooth of the series. The second molar was likewise bifanged but much smaller; it was placed close against the base of the coronoid.

The whole jaw has, relatively, a greater depth than that of the Raccoon, and is remarkably straight upon its lower border, whereas in the recent genus it is considerably curved. The condyle is not preserved, and the angle is somewhat damaged, but it was apparently not so strongly inflected as in the Raccoon. The masseteric fossa is deep and prominent, and the coronoid is high and broad. The inferior dental canal is placed higher than it is in the Raccoon, being slightly above the tooth line. The symphysis is relatively deeper and more robust than in *Procyon*, and the chin is heavier and more abruptly rounded.

The jaw of *Leptarctus* differs from that of *Cercoleptes* in the following characters: the coronoid is broader and of less vertical extent; the condyle is not placed so high; the angle is elevated above the lower border of the ramus, which is straight and not concave as it is in *Cercoleptes*. In the depth of the symphysis and abrupt rounding of the chin the two genera are

similar. *Cercoleptes*, moreover, has a moderately deep groove upon the antero-internal face of the canine, but differs from that of *Leptarctus* in having an external groove as well. *Cercoleptes* again resembles *Leptarctus* in having only three premolars in the lower jaw; the middle one, however, has only a single cusp upon the crown, whereas *Leptarctus* has two.

As compared with *Bassaricyon*,¹ the jaw is more robust, shorter and deeper, with a more prominent chin. The two genera differ again in the number of premolars.

Altogether, *Leptarctus* appears to offer a number of transitional characters between the more typical Procyonidae and the aberrant *Cercoleptes*. This is especially to be seen in the proportions of the jaw, the reduction of the number of premolars, the reduction in size of the last molar, as well as the depth of the mandibular symphysis.

¹ See J. A. Allen's paper, Proc. Phil. Acad., 1876, p. 21.



