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A NEW BARYLAMBDID PANTODONT FROM THE LATE PALEOCENE

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A quarry discovered during the field season of 1939 by a Chicago Natural History Museum party working in the late Paleocene beds of western Colorado yielded numerous disarticulated remains of a large barylambdid pantodont. It was at once evident, following preparation, that this animal was distinct generically from the large *Barylambda faberi*, and certainly distinct specifically from the smaller *Haplolambda quinni* (Patterson, 1939), both from the same horizon. The nature of the type and only specimen of *H. quinni* (the anterior half of a skeleton, much of it pieced together and restored from weathered-out fragments) left some doubt as to the degree of relationship between this form and the new one, and description of the latter was accordingly postponed. During recent years much pantodont material has been obtained from the Paleocene of the Polecat Bench formation of Wyoming by Princeton University parties under Professor Glenn L. Jepsen, supported by the William Berryman Scott Research Fund. This has now been prepared and is under study by Simons. Comparison of the Chicago and Princeton collections shows that *Haplolambda* and the new form are represented in both and that they are beyond doubt generically distinct. A specimen from Colorado in the Carnegie Museum also proves referable to the new form.

Edinger (1950, 1956) has published some notes on the frontal sinus and endocranial cast of Colorado specimens of the new form under the name of *Haplolambda?* sp.

We wish to express our sincere thanks to Professor Jepsen and to Dr. J. LeRoy Kay for the opportunity of studying specimens in the collections under their respective charges.

PANTODONTA
BARYLAMBDIDAE

Leptolambda[1] gen. nov.

Type species. L. schmidti sp. nov.

Distribution. Late Paleocene, Tiffanian stage; Silver Coulee beds, Polecat Bench formation, Park and Bighorn counties, Wyoming; Plateau Valley beds, DeBeque formation, Mesa County, Colorado.

Diagnosis. $I\frac{3}{3}\,C\frac{1}{1}\,P\frac{4}{4}\,M\frac{3}{3}$, no diastemata. Incisors above small, with lateral crest on each side; lower incisors larger than upper with lateral crests more prominent, forming a spatulate tooth comparatively longer anteroposteriorly and shorter trans-

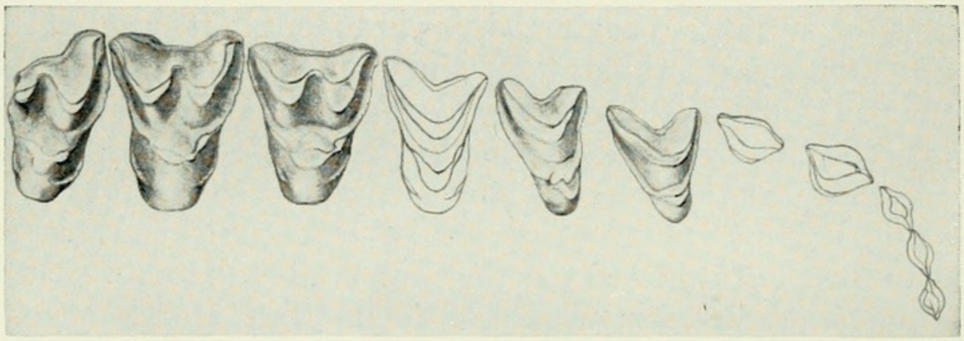

Figure 1. *Leptolambda schmidti* gen. et sp. nov. Upper dentition of right side, PU No. 14996 (unshaded teeth from PU No. 14680). x ½.

versely than in *Barylambda*. Canines smaller than in *Barylambda*, in supposed females incisiform. Premolars of typical barylambdid pattern; $P\frac{1}{1}$ one rooted; $P\frac{1}{}$ usually broader transversely than in *Barylambda*. Talonid bases of $P_{\overline{2\text{-}3}}$ comparatively larger than in *Barylambda* or *Haplolambda*, with serial homologue of crista obliqua directed anteriorly, not running obliquely anterointernally to long axis of tooth as in *Barylambda*. Upper molars differing from those of *Haplolambda* and resembling those of *Barylambda* in $M\frac{2}{}$ larger than $M\frac{1}{}$; distinguished

[1] From the Greek *leptos*, thin, slender; with reference to the less robust postcranial skeleton and more slender construction of the long bones than in *Barylambda*, plus *-lambda*, referring to the *lambda*-shaped molar crests, and to agree with related genera.

from *Barylambda* by presence of heavier cingula on $M\frac{1\text{-}2}{}$, absence of backward rotation of protocones of $M\frac{1\text{-}3}{}$. Metacone of $M\frac{3}{}$ less reduced than in *Haplolambda*. Skull with wider, longer frontal area than in *Barylambda* and *Haplolambda;* head as a whole smaller in proportion to body size than in other barylambdids. Cervical centra and neural arches very short, weak; thoracic and lumbar vertebral centra comparatively long. Postcervical vertebrae with lower neural spines than in *Barylambda* and *Haplolambda*. Caudals without (or at most with small, anterior) haemapophyses; caudal centra longer in proportion to width and height than in *Barylambda*. Scapula not as broad anteroposteriorly, particularly in postscapular portion, as in *Barylambda,* broader than in *Haplolambda;* spine proportionately narrower than in *Barylambda,* lacking tuberosity. Clavicle more slender than in *Barylambda*. Bones of forelimb shorter relative to hind than in *Barylambda;* deltopectoral crest of humerus not as flat, less projecting medially; shaft of ulna less broad from front to back, strongly retroflexed, olecranon relatively longer than in *Barylambda* and *Haplolambda*. Metacarpal I and trapezium not fused as in *Haplolambda*. Metacarpal V much shorter than in *Barylambda,* relatively shorter than in *Haplolambda,* with large lateral expansion in proximal half. Proximal and mesial phalanges differing from *Barylambda* in much greater compression (or foreshortening) along axis of digit. Bones of hind limb less robust than in *Barylambda;* femur with more slender, less flattened shaft, third trochanter nearly vestigial; tibia with more slender shaft, no pronounced cnemial crest, distal extremity proportionately less broad; proximal articulation for fibula less projecting laterally; tuber calcis of calcaneum very much shorter.

LEPTOLAMBDA SCHMIDTI[2] sp. nov.

Figs. 1-3

Type. CNHM[3] No. P26075, incomplete skull, mandibles, numerous vertebrae and ribs, incomplete scapula and pelvis, various leg and foot bones.

[2] Named for Dr. Robert G. Schmidt, who, with Dr. James H. Quinn, discovered the quarry from which nearly all the Plateau Valley material of this species was obtained.

[3] Abbreviations are as follows: CNHM, Chicago Natural History Museum; CM, Carnegie Museum; PU, Princeton University.

Hypodigm. Type and CNHM Nos. P26076-7, incomplete skull, various vertebrae and ribs, incomplete scapula, various leg and foot bones; P15558, P15571, incomplete dentitions; CM No. 11353, facial region of skull with dentition; PU Nos. 14680, 14879, and 14996, partial skeletons; PU Nos. 14681, 14990, 14992, mandibles.

Horizon. DeBeque formation, Plateau Valley local fauna, Mesa Co., Colorado; lower levels of the Silver Coulee beds, Polecat Bench formation, Park and Bighorn counties, Wyoming.

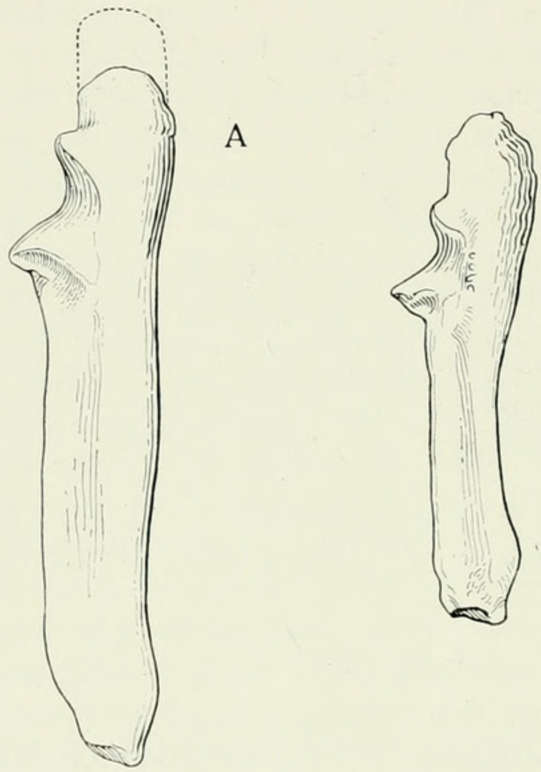

Figure 2. *A*, ulna of *Barylambda faberi* Patterson, CNHM No. P26110, and *B*, ulna of *Leptolambda schmidti* gen. et sp. nov., PU No. 14879. x 1/8.

Localities. CNHM Nos. P26075-7 from one quarry approximately four miles SSE. of DeBeque, Mesa Co., Colorado (due to complete lack of association in this quarry there is uncertainty as to the precise allocation of the individual bones to these numbers); CM No. 11353, 2 to 3 miles west of DeBeque, Mesa Co., Colorado; PU Nos. 14680 and 14681 from the south side of Polecat Bench, Park Co., Wyoming; PU Nos. 14879, 14990, 14992, and 14996 from separate localities along a NE-SW line between the towns of Lovell and Greybull in T 54 and 55 N, R 95 and 96 W, Bighorn County, Wyoming.

Diagnosis. As for the genus; size approximately as in *Barylambda faberi* or somewhat smaller, but proportions clearly very different. Specimens from Colorado and from Wyoming fall

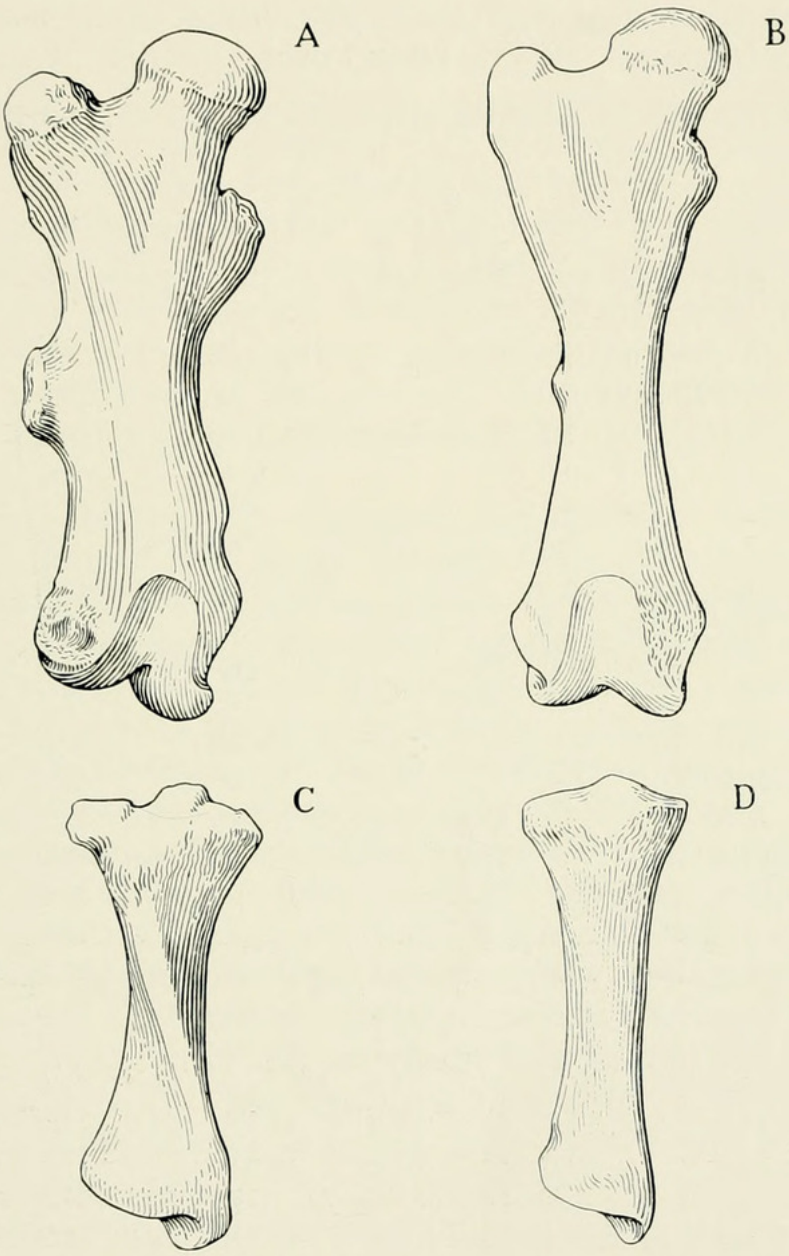

Figure 3. Femora and tibiae of *A*, *C*, *Barylambda faberi* Patterson, CNHM No. P14944, and *B*, *D*, of *Leptolambda schmidti* gen. et sp. nov., CNHM Nos. P26075, type and P26077. x ⅛.

into two rather sharply defined size groups, one 20-30 per cent smaller than the other. The distinction is most apparent in the region of the canine, within the dentition, and in the postcranial skeleton. Differences of approximately this order of magnitude also occur in *Barylambda faberi*. We interpret them as indicating a sexual difference in size.

TABLE 1

MEASUREMENTS OF THE DENTITION, IN MILLIMETERS

		CNHM P26075	CM 11353[4]	PU 14680	PU 14879	PU 14996			CNHM P26075	PU 14680	PU 14681	PU 14990
I^1	ap		6.0				I^1	ap		8.0	8.8	8.0
	tr		5.2					tr		6.0	6.2	6.2
I^2	ap			7.7			I^2	ap		10.0	11.0	10.5
	tr			6.3				tr		6.2	6.8	7.0
I^3	ap		8.8	9.1			I^3	ap		11.5	12.7	10.5
	tr		9.0	6.8				tr		7.0	7.7	7.0
C	ap	14.5	13.4	10.9			C	ap		12.8	15.7	12.3
	tr	15.0	13.5	8.8				tr		8.8	11.4	7.2
P^1	ap		15.0	14.6	13.8		P^1	ap		13.5		16.0
	tr		14.0	8.4	8.0			tr		8.6		8.6
P^2	ap	18.0	16.0			18.2	P^2	ap		20.5	21.5	19.0
	tr	25.0	26.0			25.5		tr		12.3	15.7	12.6
P^3	ap	20.5	17.0		17.0	17.8	P^3	ap	22.5	20.5	20.5	19.0
	tr	27.2	29.5		25.0	27.0		tr	18.0	16.0	18.3	15.0
P^4	ap		18.0				P^4	ap	22.0	21.0	21.6	20.2
	tr		32.0					tr	20.5	18.0	19.5	17.0
M^1	ap		26.0	23.0		24.5	M_1	ap	25.0	22.5	23.2	21.8
	tr		36.0	31.5		31.6		tr trig	19.5	17.0	18.0	18.2
M^2	ap	26.0	27.0	23.5	22.8	25.3		tr tal	19.5	17.8	18.3	16.0
	tr	36.0	39.0	32.5	34.1	35.3	M_2	ap	26.7	23.0	24.5	23.3
M^3	ap	21.0	21.0	17.4	18.1	19.8		tr trig	21.0	17.0	18.2	17.2
	tr	34.5		30.0	31.2	33.4		tr tal	17.0	17.0	18.3	15.4
							M_3	ap	31.5	26.0	30.4	29.0
								tr trig	19.0	16.3	18.2	17.5
								tr tal	13.5	13.4	14.4	12.5

[4] The anteroposterior diameters of the upper cheek teeth of this specimen appear to have been somewhat reduced by wear.

Remarks. The Carnegie Museum specimen furnishes an interesting footnote to the history of Paleocene exploration. The Plateau Valley fauna did not come to scientific attention until the early 1930's, following Edwin B. Faber's discovery of the type and other specimens of *Barylambda faberi.* CM No. 11353, however, was collected by Earl Douglass about 1909, was tentatively identified as *Pantolambda?* sp., and the horizon recognized as Paleocene. Having made and correctly interpreted this remarkable find, Douglass went on to the discovery of the great Jensen dinosaur quarry, exploitation of which so fully occupied the rest of his working life that he was never able to follow up the lead provided by this first identified Paleocene mammal from western Colorado. As an additional item of interest, his specimen provides our only adequate knowledge of the facial region of *Leptolambda schmidti,* a part otherwise represented only by isolated maxillaries in the Chicago Natural History Museum material and by a much crushed skull in the Princeton collections.

The field evidence in Colorado suggests that *Leptolambda schmidti* differed from other Plateau Valley pantodonts as regards habitat. The previously known forms were all found in mud- or siltstones, whereas every specimen identifiable as *L. schmidti* was collected from the fillings of stream channels. The quarry that yielded the great bulk of the material was in such a situation, the disarticulated bones occurring at the junction of a channel fill with the underlying mudstone but clearly deposited in the channel. *Leptolambda* presumably inhabited higher ground marginal to the basin in which DeBeque sedimentation was going on, with fragments and occasionally whole or partial carcasses being carried down into the area of deposition. The specimens of *Leptolambda* collected in the Bighorn Basin of Wyoming neither confirm nor deny this conjecture. At least three specimens, PU Nos. 14680, 14681, and 14879 were collected from mudstones, whereas PU Nos. 14990, 14992, and 14996 were recovered from sandstones. Nevertheless, the possibility that *Barylambda* and *Leptolambda* were adapted to rather different environments is suggested, in Wyoming, by the fact that the former genus has not been recovered from the Bighorn Basin, although *Leptolambda* is comparatively common there for a pantodont, being represented by more than twenty-five separate finds. Since these two genera occur at the same stratigraphic levels in Colorado it is clear they were co-existent in time and therefore the absence of *Barylambda* in the Polecat Bench formation suggests that the environmental conditions under which it flourished did not exist in the region of the Bighorn Basin during the deposition of the Silver Coulee beds.

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