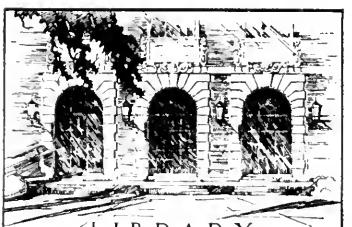

GEOLOGICAL SERIES
OF
FIELD MUSEUM OF NATURAL HISTORY

Volume VI | CHICAGO, AUGUST 30, 1938 | No. 21

NEW CROCODILIANS FROM THE UPPER PALEOCENE OF WESTERN COLORADO

BY KARL P. SCHMIDT
CURATOR OF REPTILES AND AMPHIBIANS, DEPARTMENT OF ZOOLOGY

Among the Paleocene fossils collected by Messrs. Elmer S. Riggs, Bryan Patterson, James H. Quinn, and Theodore Burdosh, in the course of field work in the summer of 1937 in the Plateau Valley Beds of Mesa County, western Colorado, are two eusuchian skulls sufficiently complete to warrant description. One of these is a large elongate crocodilid skull, with the palatal surface nearly complete, referable to *Leidyosuchus*, while the other is a very different form with a short and broad skull of the alligatorid type. It is possible to associate with these skulls some fragmentary material from other individuals from the same general locality and horizon. I am indebted to Mr. Elmer S. Riggs, Curator of Vertebrate Paleontology, for the privilege of describing this material, and to Messrs. Patterson and Quinn, who have been constantly helpful in the preparation of the descriptions. The specimens described have been prepared by Mr. Quinn. The drawings are the work of Mr. John J. Janecek. For a brief account of the Plateau Valley Beds, reference may be made to Patterson (1934 and 1937).

The smaller specimen exhibits a character unique among crocodilians—the enlargement of the squamosals into triangular horn-like knobs at the posterior angles of the cranial table. It may be referred to a new genus, named in allusion to this character.

Order **Loricata**
Suborder **Eusuchia**
Family **Alligatoridae**

Ceratosuchus, gen. nov.

Diagnosis.—Allied to *Allognathosuchus* in having enlarged posterior teeth; distinguished in having the squamosals vertically enlarged and compressed to form horn-like triangular knobs. Upper

jaw overhanging lower, fourth maxillary tooth largest; snout short and broad; palatine fenestrae short; palatines and pterygoids not inflated; supratemporal fossae large at the surface, narrowed below. Following Mook (1934), the new genus is referred to the Alligatoridae. Designated type, *Ceratosuchus burdoshi*, sp. nov.

Ceratosuchus burdoshi, sp. nov.

Holotype.—Field Museum of Natural History No. P15576. A crushed skull, without mandibles, with dorsal and palatal surfaces nearly complete. Collected by Theodore Burdosh.

Paratypes.—Five separate horn-like squamosals, Nos. P15437a–e; a squamosal, fragmentary mandible, worn heads of two limb bones, and other associated bony fragments, No. 15436; two fragmentary vertebrae and a nearly complete humerus, with associated small fragments, No. P15562.

Horizon and type locality.—Plateau Valley Beds (upper Paleocene), near Mesa, Mesa County, Colorado.

Diagnosis.—An alligatorid crocodilian with enlarged posterior maxillary teeth, readily distinguished from all known forms by the horn-like vertical expansion of the squamosals; snout a little shorter than its width just anterior to the orbits.

Description of type.—Skull short and broad, slightly narrowed anterior to the orbits; upper surface moderately pitted; anterior part of skull without conspicuous ridges; a low anteorbital ridge suggested; squamosals vertically enlarged, horn-like; postfrontals also vertically raised, confluent with the slope of the squamosals; supratemporal fossae large on the surface of the skull, much reduced below; cranial table with an overhanging posterior ridge; palatal surface much cracked, only the palatine-maxillary suture certainly definable; ectopterygoids short and bent; sutures of the dorsal surface of the skull all extremely obscure.

Five premaxillary and fourteen maxillary teeth in the upper jaw, none complete; maxillary teeth enlarging to the third and fourth, then abruptly smaller to the tenth; tenth to fourteenth, represented by sockets which are apparently confluent, much enlarged. The confluence of the posterior alveoli recalls Mook's description of *Allognathosuchus polyodon.*

Measurements.—The measurements (in millimeters) include approximate measurements of the skull as a whole, as restored by Mr. Quinn; these are distinguished by the sign ±.

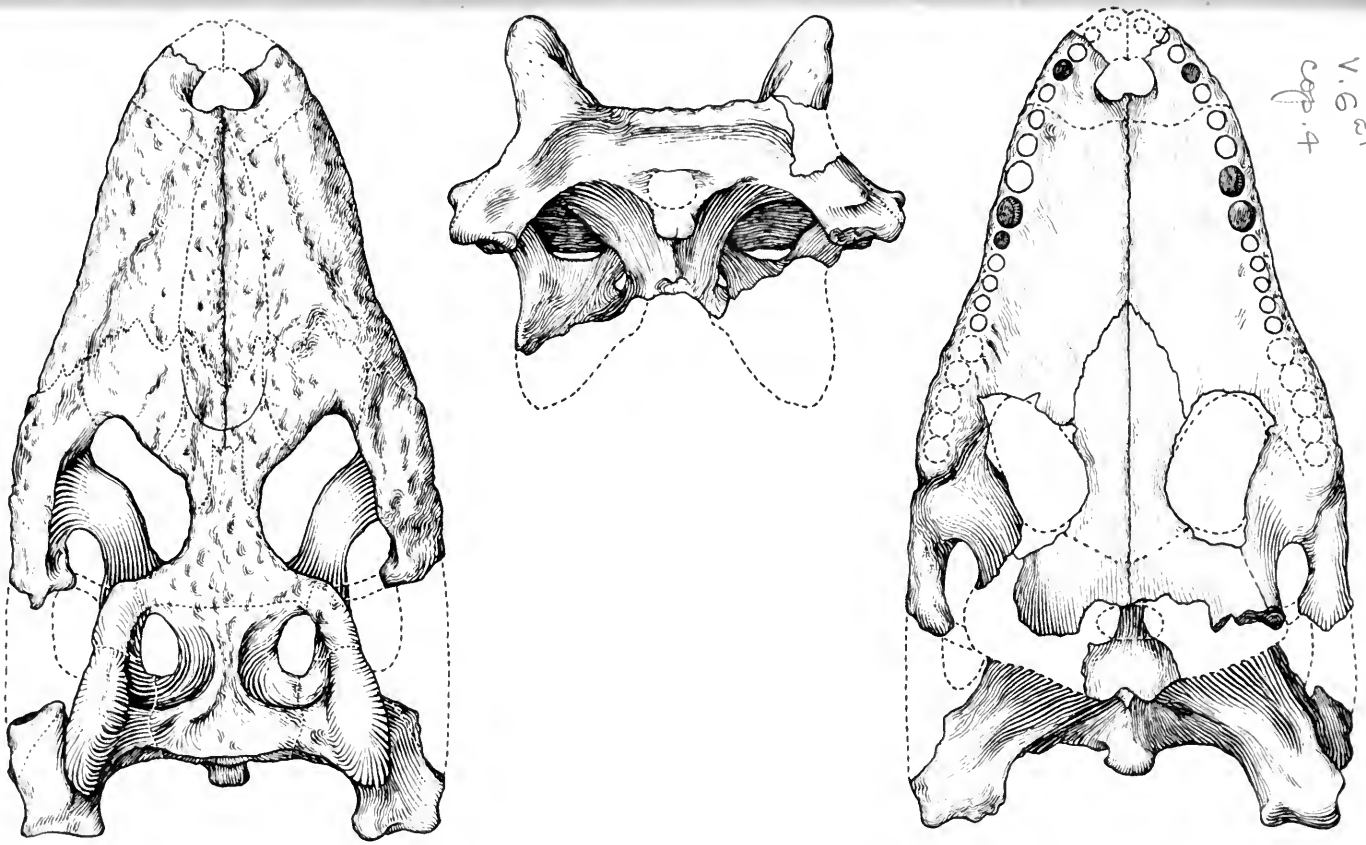

FIG. 83. Dorsal, palatal, and posterior views of skull of *Ceratosuchus burdoshi*, sp. nov., type.

MEASUREMENTS

	MM.
Length to posterior border of cranial table	232±
Width cranial table	98±
Width at anterior border of orbits	131
Length of snout	124±
Width at condyles	133
Width of frontal between orbits	25
Width of parietal between temporal openings	9
Diameter of fifth maxillary tooth	10
Antero-posterior length of the squamosal "horn"	44
Lateral width of the squamosal "horn"	17

Discussion.—The mandible, No. P15436, consists of the crushed anterior third, with part of the surangular, and a fragment of bone belonging to the lower border of the angular. The symphysis is short.

The separate squamosals range in antero-posterior length from 37 mm. to 48 mm., which seems to indicate that the type skull represents an individual of average adult size. There is considerable variation in form in the seven available squamosals, in which the thickness bears no uniform proportion to the height.

Mook (1921, p. 110) suggested the probability that *Allognathosuchus* would be found to range into the Paleocene. The posterior part of the skull of this genus is known only from *A. mooki* Simpson (1930), from the Puerco Beds of New Mexico, which does not have horn-like expansions of the squamosal.

Crocodylidae

Leidyosuchus riggsi, sp. nov.

Holotype.—F.M. No. P15582. Skull with nearly complete palate and part of cranial table. Collected by Elmer S. Riggs.

Paratype.—Fragment of mandibular ramus with five teeth. Property of A. A. Look, Grand Junction, Colorado.

Horizon and type locality.—Plateau Valley Beds (upper Paleocene), Debeque, Mesa County, Colorado.

Diagnosis.—A crocodilian with tooth form, number of teeth, and general skull form of *Leidyosuchus;* readily distinguished from the known species by its much more elongate snout.

Description of type.—The type skull has the palatal surface complete except for the premaxillaries, the left maxillary border, and the left ectopterygoid; upper surface very incomplete; jugal arch and posterior outline of skull well preserved. Frontal and part of cranial table deeply pitted; supratemporal fenestrae large; frontal flat; no trace of anteorbital ridges; palatines narrow, uninflated, nearly parallel-sided; posterior narial opening inferior, near

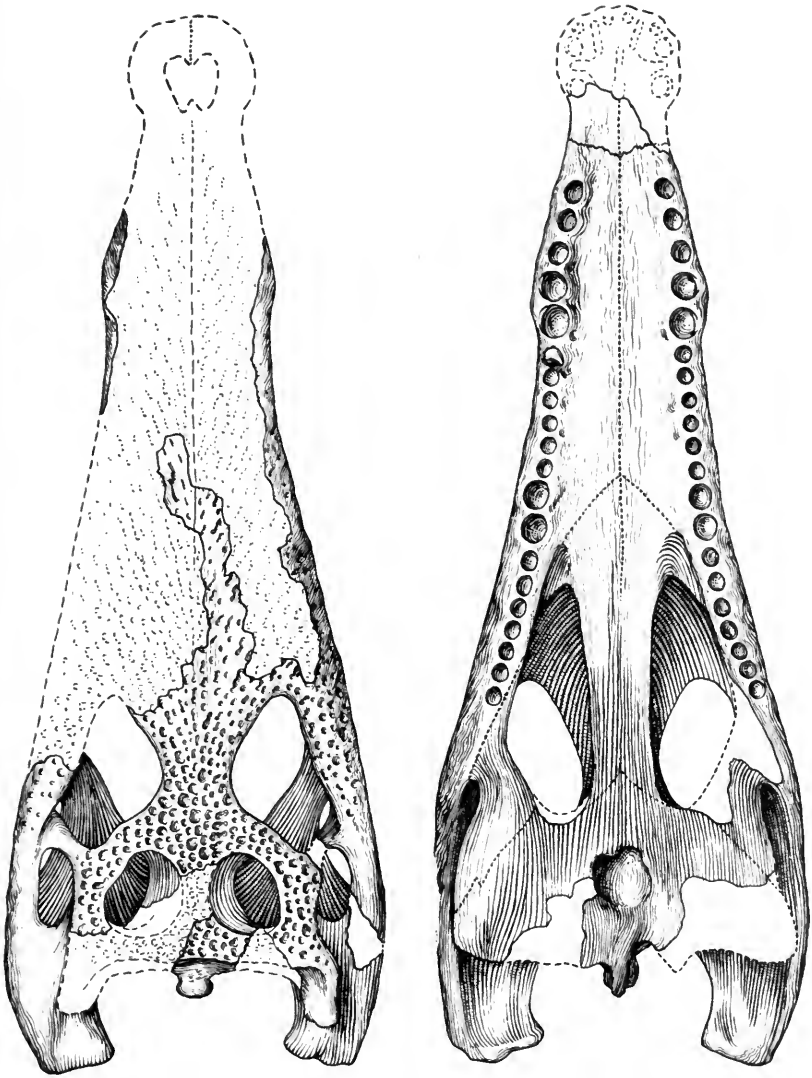

FIG. 84. Dorsal and palatal views of skull of *Leidyosuchus riggsi*, sp. nov., type.

the middle of the pterygoid suture; pterygoids with a deep posterior notch.

The single tooth preserved with the skull has the lateral and somewhat inwardly directed keels characteristic of *Leidyosuchus*. There are 20 maxillary teeth and presumably four or five premaxil-

lary, the fourth lower tooth biting into a broad notch, the maxillary teeth apparently outside the line of the mandibular; fourth and fifth maxillary teeth much enlarged, fifth largest.

Measurements.—The measurements include approximate measurements of the skull as restored by James H. Quinn, distinguished by the sign ±.

	MM.
Tip of snout to posterior border of cranial table	510±
Tip of snout to posterior border of pterygoid notch	504±
Length of snout anterior to orbital fenestrae	364±
Breadth of snout at base	161
Greatest breadth of skull	203
Breadth of palatines	31
Breadth of frontal between orbits	36
Breadth of supratemporal fenestra	37
Breadth of parietal between supratemporal fenestrae	16

Description of paratype.—The fragment of mandibular ramus kindly lent for examination by A. A. Look, of Grand Junction, Colorado, includes seven and a half tooth sockets, with five well-preserved teeth. These exhibit the lateral, inwardly directed ridges of the single tooth in the type skull, but the teeth are more flattened. The inner face of the tooth, between the ridges, is nearly one-half the diameter of the tooth, rather than about one-third, as in *L. sternbergii.*

Discussion.—The number of maxillary teeth is 20, as in *L. acutidentatus* Sternberg (1932, p. 128), not 19, as in *L. sternbergii* (Mook, 1925, p. 412). This is in correlation with the increased length of the skull in the longer-headed forms. On the other hand, the long hiatus between the last premaxillary and the first maxillary tooth seems to indicate that the elongation of the skull has developed independently of the number of teeth.

Leidyosuchus, originally described from the Cretaceous, is known from the Paleocene Torrejon Beds of New Mexico through Mook's description of *L. multidentatus* (Mook, 1930) and from the Paleocene of Saskatchewan in Sternberg's *L. acutidentatus. L. multidentatus* is known from the mandibles and from fragments of the axial skeleton. While the mandibles indicate a long-skulled type, it does not seem at all likely that the skull here described could be conspecific with the Torrejon species. That the present species is closest to *L. acutidentatus* is shown by the number of maxillary teeth, 20 in both; it is distinguished from the Saskatchewan form by its much more elongate snout, in which the breadth is only 0.44 of the length, as compared with 0.56 in *L. acutidentatus.* The new form appears also to have proportionately larger supratemporal fenestrae.

REFERENCES

MOOK, C. C.

1921. Allognathosuchus, a New Genus of Eocene Crocodilians. Bull. Amer. Mus. Nat. Hist., **44**, pp. 105–110, pl. 15.

1925. A Revision of the Mesozoic Crocodilia of North America. Bull. Amer. Mus. Nat. Hist., **51**, pp. 319–432, figs. 1–63, pls. 4–5.

1930. A New Species of Crocodilian from the Torrejon Beds. Amer. Mus. Nat. Hist., Nov., No. 447, pp. 1–11, figs. 1–7.

1934. The Evolution and Classification of the Crocodilia. Journ. Geol., **42**, pp. 295–304.

PATTERSON, BRYAN

1934. A Contribution to the Osteology of Titanoides and the Relationships of the Amblypoda. Proc. Amer. Phil. Soc., **73**, pp. 71–101, figs. 1–13, pls. 1–2.

1937. A New Genus, Barylambda, for Titanoides faberi, Paleocene Amblypod. Field Mus. Nat. Hist., Geol. Ser., **6**, No. 16, pp. 229–231.

SIMPSON, G. G.

1930. Allognathosuchus mooki, a New Crocodile from the Puerco Formation. Amer. Mus. Nat. Hist., Nov., No. 455, pp. 1–16, figs. 1–6.

STERNBERG, C. M.

1932. A New Fossil Crocodile from Saskatchewan. Canad. Field Nat., **46**, pp. 128–133, figs. 1–2.