THE SMALLER PERISSODACTYLS OF THE IRDIN MANHA FORMATION, EOCENE OF MONGOLIA

BY W. D. MATTHEW AND WALTER GRANGER

A series of skulls of titanotheres, complete skeleton of an amynodont rhinoceros, and various more fragmentary specimens of these two families of Perissodactyla, were secured from the Irdin Manha formation by the Third Asiatic Expedition in 1923. They are described by Professor Osborn in forthcoming numbers of American Museum Novitates. Besides these larger animals, there were numerous fragmentary remains of small perissodactyls assigned to the present writers for study and description. They appear to be referable to the Helaletidae, Lophiodontidae, and Hyracodontidae, the entire absence of horses and palæotheres being a feature of this and other early Tertiary faunas of Mongolia.

Helaletidae (?Colodontidae)

Desmatotherium mongoliense Osborn

Type.—No. 19161, a right maxilla with p2–m3.

This species was based upon "parts of ten individuals of a small lophiodont," among which the specimen selected as type belongs to a different genus and family from the rest. The species is here restricted to the type maxilla among the 1922 collections, the other specimens being referred to the lophiodont genus Lophialetes. The description and measurements of D. mongoliense are based only in part upon the type, and are rather misleading. It is about the same size as D. guyotianum, not smaller; the metacone is not flat but deeply concave, with its free flange quite short; referred specimens show that in m3 it is further reduced. The lower molars are sharply cross-crested, and m3 has no heel. The premolars are of the helaletid type, very different throughout from the hyracodont premolars, but resembling those of D. guyotii and of Colodon; more primitive than in the latter, and more progressive than in Helaletes.

56.9,72(1181:51.7)

Fig. 1. *Desmalotherium mongoliense* Osborn, 1922. Upper jaw, type specimen, No. 19161.

Natural size, external and occlusal views.
**Desmatotherium fissum**, new species

**Type.**—No. 20161, upper jaw fragment, p²-4.

**Characters.**—Somewhat smaller than *D. mongoliense*, the internal cusps of p² and p³ wide apart, that of p⁴ indicated by a sharp groove on the inner face and a broadening of the apex. Paracone and metacone on p²-⁴ well separated, convex externally, parastyles lower and somewhat smaller cusps, no distinct metastyles.

---

**Teleolophus¹ medius**, new genus and species

**Type.**—No. 20166, lower jaw with p₁-m₃.

**Paratypes.**—No. 20163, lower jaw, p₁-m₃; No. 21064, upper jaw, dp₄-m₁; No. 20165, miscellaneous upper and lower teeth and jaw fragments. All from the Irdin Manha formation, Telegraph Line Camp.

**Characters.**—Lower molars sharply cross-crested, increasing in size from first to third, no heel on m₃, premolars all two-rooted, non-molariform, a transverse crest in front and an anteroposteriorly-crested hypoconid behind, entoconid rudimentary. On p₃ the transverse crest is imperfect and on p₁ barely suggested. Upper molars with high, crested protoloph and metaloph curving around externally to join the flattened paracone at its anterior and posterior ends; the metacone has practically disappeared, the only vestiges of it being small crests (=free posterior flange of

---

¹Greek ῥητός, complete, perfect; λόφος, crest.
Fig. 4. *Teleolophus medius*. Lower jaw, type specimen, No. 20166. Natural size, external view and crown view of premolar-molar series.
ectoloph) at the postero-external angles of m¹-² which rise only half-way up to the vertex of the metaloph and are entirely absent on m³.

Length of p₁-m₂ = 52 mm. Dimensions of m³, a.-p. X tr. = 21 X 26 mm.

This genus differs from "Desmatotherium" mongoliense and fissum as well as from the type of Desmatotherium in the decidedly higher and more sharply-crested crowns, reduction of the metacone on the upper molars, absence of heel on m₃, of entoconid on p₄, etc. The molars are very like those of Deperetella but the premolars are simpler, resembling those of Desmatotherium. It may well be ancestral to Deperetella.

Fig. 5. Teleolophus medius. Upper teeth. Composite of three specimens, Nos. 20164, 20165, 20168, as indicated in the drawing.

Natural size, external and crown views.

Lophiodontidae

Lophialates¹ expeditus, new genus and species

Type.—No. 19163, upper jaw, with p⁴-m³ r.

Paratypes.—Nos. 19162, 20144-20160.

Horizon and Locality.—Irdin Manha, type locality.

Characters.—Metacones of upper molars flat externally, with long, free flange. Lower molars sharply lophodont, with connecting crests moderately developed; a reduced third lobe on m₃, with looped crest as in Lophiodon. Upper premolars with crested metacone, nearly flat externally, inner crescents undivided, but both wings

¹Lophiodon + Helaletes—as combining characters of the two genera.
Fig. 6. *Lophialetes expeditus*. Upper jaw, type specimen, No. 19163.
Natural size, external view and crown view of teeth; anterior premolars from No. 20160.

Fig. 7. *Lophialetes expeditus*. Lower jaw, No. 19162.
Natural size, superior and external views.

The upper molars have the primitive rhinocerotoid structure much as in *Triplopus*, but the last lower molar has a distinctly *Lophiodon*-
like heel. The construction of the premolars distinguishes it from the type of *Prothyracodon* as well as from that of *Triplopus*.

A great number of fragmentary specimens, teeth and parts of jaws from the type locality of the Irdin Manha formation belong to this genus, and represent probably one rather widely varying species. The skull is sufficiently known (No. 20144) to show that it has somewhat the helaletid type of recession of the nares. The feet are not known.

The present genus resembles the Hyracodontidae in the rhinocerotoid type of the upper molars, sharply crested, with the metaloph joining the ectoloph far forward, and the external face of the ectoloph flat behind the anterior pillar. The premolars are rather helaletid than hyracodont in type, and the heel of m3 is of the looped type of *Lophiodon*, differing from the small transverse heel of *Helaletes* or the absence of heel in *Triplopus* or in *Hyracodon*. It appears to occupy a somewhat intermediate position, not closely related to any of these groups, and probably will have to be placed in a separate subfamily, *Lophialetinae*, distinguished by the above combination of characters.

**Lophialetes minutus**, new species

**Type.**—No. 20139, upper molar, Irdin Manha beds, Telegraph Line Camp, Mongolia.

**Characters.**—Size little more than half the preceding; diameters of molar a.-p. \( \times \) tr. = 8 \( \times \) 9 mm. No crista at head of median valley.

**Hyracodontidae**

**Caenolophus proficiens**, new species

**Type.**—No. 20141, lower jaw, \( p_{1}-m_{4} \), from Irdin Manha formation, Mongolia.

**Species Characters.**—Size larger than *C. promissus* of the Shara Murun (type of the genus), \( p_{1}-m_{2} = 89 \), \( m_{1-3} = 54 \) mm. Lower molars moderately increasing from
Fig. 9. Canolophus projectens. Lower jaw, external view, and crown view of teeth. Type specimen, No. 20414. Natural size.
first to third, posterior crest of m₃ pitched forward and inward, with a narrow cingular ledge behind it, coming to a blunt point posteromedially. Third and fourth premolars submolariform, first and second nearly simple, with a double posterior crest; p₁ in type two-rooted and crowded so as to be mainly internal to p₂ instead of anterior to it (probably abnormal—in No. 20140 it is one-rooted and not displaced).

Two isolated upper teeth, probably dp³ and m², from the Irdin Manha beds are referred to this species. They are hardly distinguishable from C. obliquus of the Shara Murun. Other specimens referred to C. proficiens show the characters of the front teeth. They retain the primitive characters from which typical amynodonts have departed by enlargement of the canines to powerful tusks, and typical hyracodonts by reduction of the canines to completely incisiform status. In one specimen of C. proficiens, however, the second incisor appears to be moderately enlarged, thus suggesting a beginning of the true rhinoceros specialization in which i₂ becomes a powerful tusk. Unfortunately the tooth is broken off, and of the adjacent teeth only the roots remain.

The genus is placed provisionally in the Hyracodontidae. It is not nearly related to Lophialetes, or to Desmatotherium.