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THE SMALLER PERISSODACTYLS OF THE IRDIN MANHA FORMATION, EOCENE OF MONGOLIA¹

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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 *Helaletidæ*, *Lophiodontidæ*, and *Hyracodontidæ*, the entire absence of horses and palæotheres being a feature of this and other early Tertiary faunas of Mongolia.

Helaletidæ (?Colodontidæ)

Desmatotherium mongoliense Osborn

TYPE.—No. 19161, a right maxilla with p²-m².

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*.

¹Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 61.

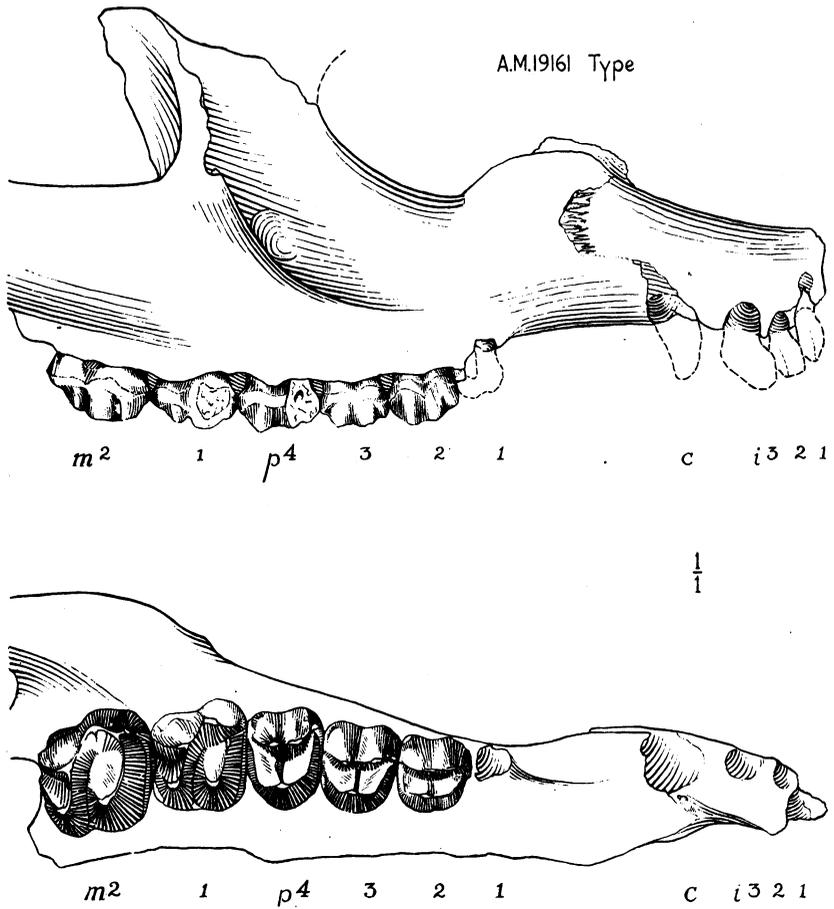


Fig. 1. *Desmatotherium mongoliense* Osborn, 1922. Upper jaw, type specimen, No. 19161.

Natural size, external and occlusal views.

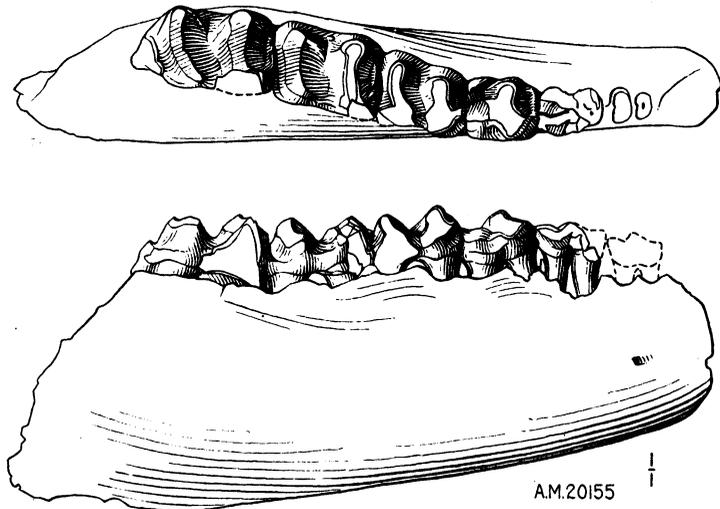


Fig. 2. *Desmatotherium mongoliense*. Lower jaw, No. 20155.
Natural size, external and superior views.

***Desmatotherium fissum*, new species**

TYPE.—No. 20161, upper jaw fragment, p^{2-4} .

CHARACTERS.—Somewhat smaller than *D. mongoliense*, the internal cusps of p^2 and p^3 wide apart, that of p^4 indicated by a sharp groove on the inner face and a broadening of the apex. Paracone and metacone on p^{2-4} well separated, convex externally, parastyles lower and somewhat smaller cusps, no distinct metastyles.

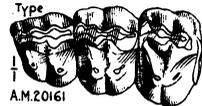


Fig. 3. *Desmatotherium fissum*. Upper premolars, type specimen, No. 20161.
Natural size, crown view.

***Teleolophus*¹ *medius*, new genus and species**

TYPE.—No. 20166, lower jaw with p_1 - m_3 .

PARATYPES.—No. 20163, lower jaw, p_4 - m_3 ; No. 21064, upper jaw, dp^4 - m^1 ; No. 20165, miscellaneous upper and lower teeth and jaw fragments.

All from the Irдин Manha formation, Telegraph Line Camp.

CHARACTERS.—Lower molars sharply cross-crested, increasing in size from first to third, no heel on m_3 , premolars all two-rooted, non-molariform, a transverse crest in front and an anteroposteriorly-crested hypoconid behind, entoconid rudimentary. On p_2 the transverse crest is imperfect and on p_1 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 τέλειος, complete, perfect; λόφος, crest.

A.M.20166 Type

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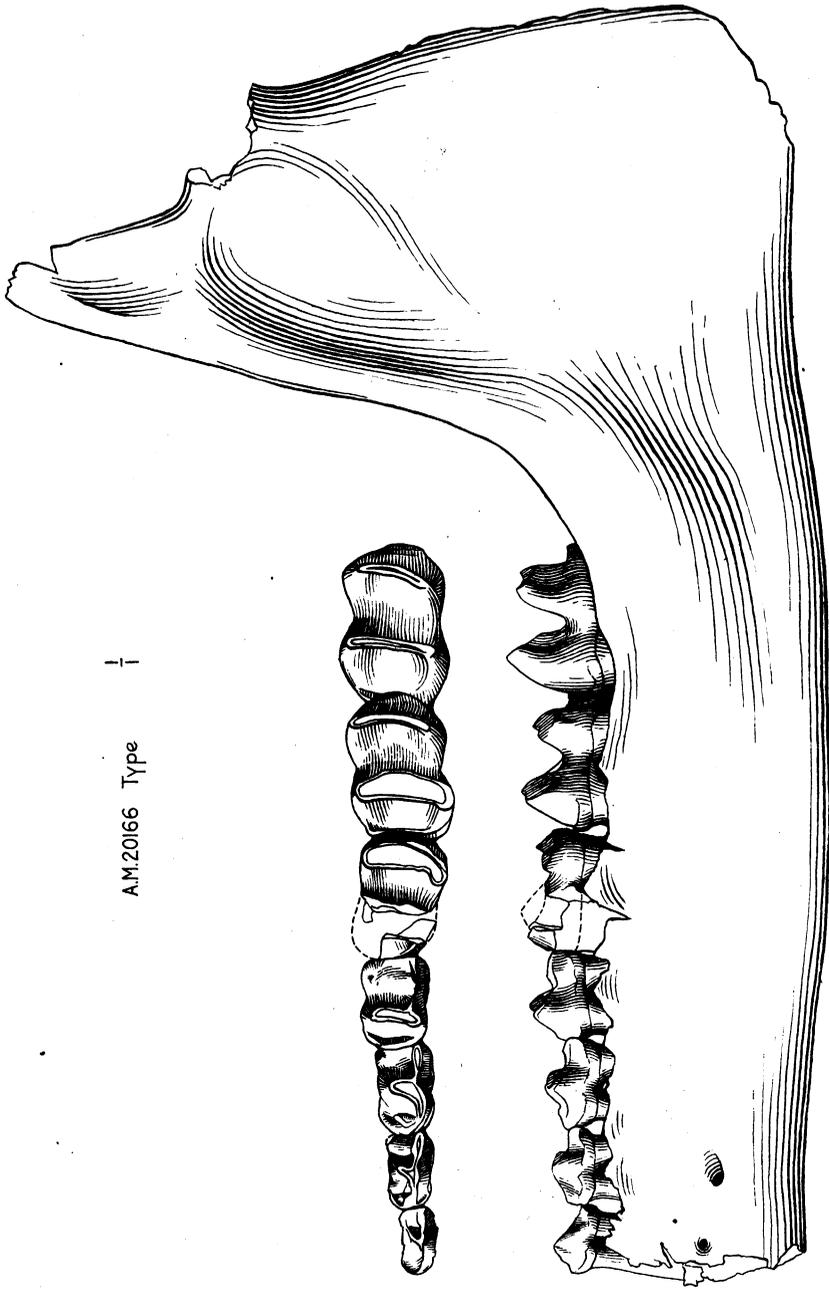


Fig. 4. *Teleolophus medius*. Lower jaw, type specimen, No. 20166. Natural size, external view and crown view of premolar-molar series.

ectoloph) at the postero-external angles of m^{1-2} which rise only half-way up to the vertex of the metaloph and are entirely absent on m^3 .

Length of p_1 - m_3 = 52 mm. Dimensions of m^3 , a.-p. \times tr. = 21 \times 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 m_3 , of entoconid on p_4 , 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*.

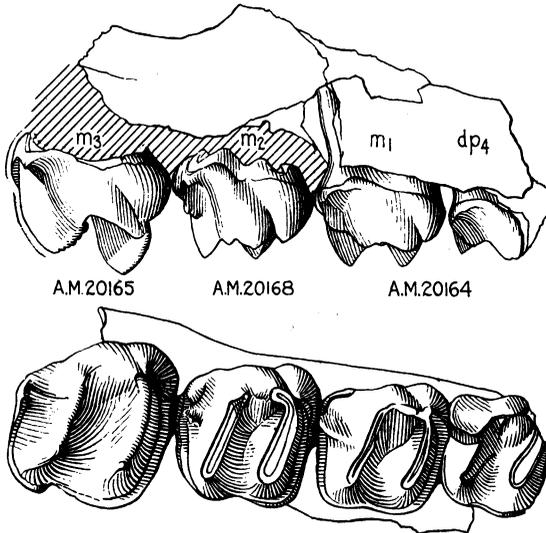


Fig. 5. *Teleolophus medius*. Upper teeth. Composite of three specimens, Nos. 20164, 20165, 20168, as indicated in the drawing.

Natural size, external and crown views.

Lophiodontidae

*Lophialetes*¹ *expeditus*, new genus and species

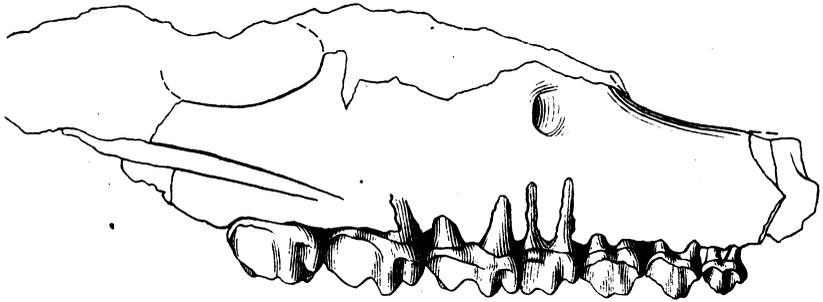
TYPE.—No. 19163, upper jaw, with p^4 - m^3 r.

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 m_3 , with looped crest as in *Lophiodon*. Upper premolars with crested metacone, nearly flat externally, inner crescents undivided, but both wings

¹*Lophiodon* + *Helaletes*—as combining characters of the two genera.

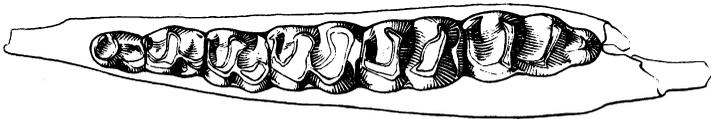


AM.19163

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Fig. 6



A.M.19162

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Fig. 7

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.

complete on p^{3-4} . Size one-sixth smaller than *Desmatotherium guyotii*, $m^{1-3} = 37$ mm.; $p_2-m_3 = 67$ mm. (Osborn, 1923, "*D. mongolicum*").

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 Hyracodontidæ 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

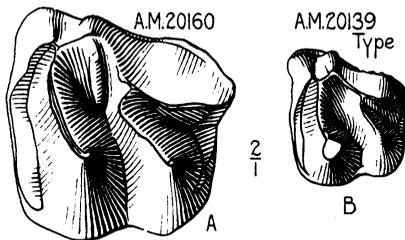


Fig. 8. *Lophialetes expeditus* and *L. minutus*. Upper molars, Nos. 20160, and 20139 (type).

Twice natural size, crown view.

type, and the heel of m_3 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, **Lophialetinæ**, 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. = 8×9 mm. No crista at head of median valley.

Hyracodontidæ

***Cænolophus proficiens*, new species**

TYPE.—No. 20141, lower jaw, p_1 - m_3 , from Irdin Manha formation, Mongolia.

SPECIES CHARACTERS.—Size larger than *C. promissus* of the Shara Murun (type of the genus), p_1 - m_3 = 89, m_1 - m_3 = 54 mm. Lower molars moderately increasing from

AM.20141 Type †

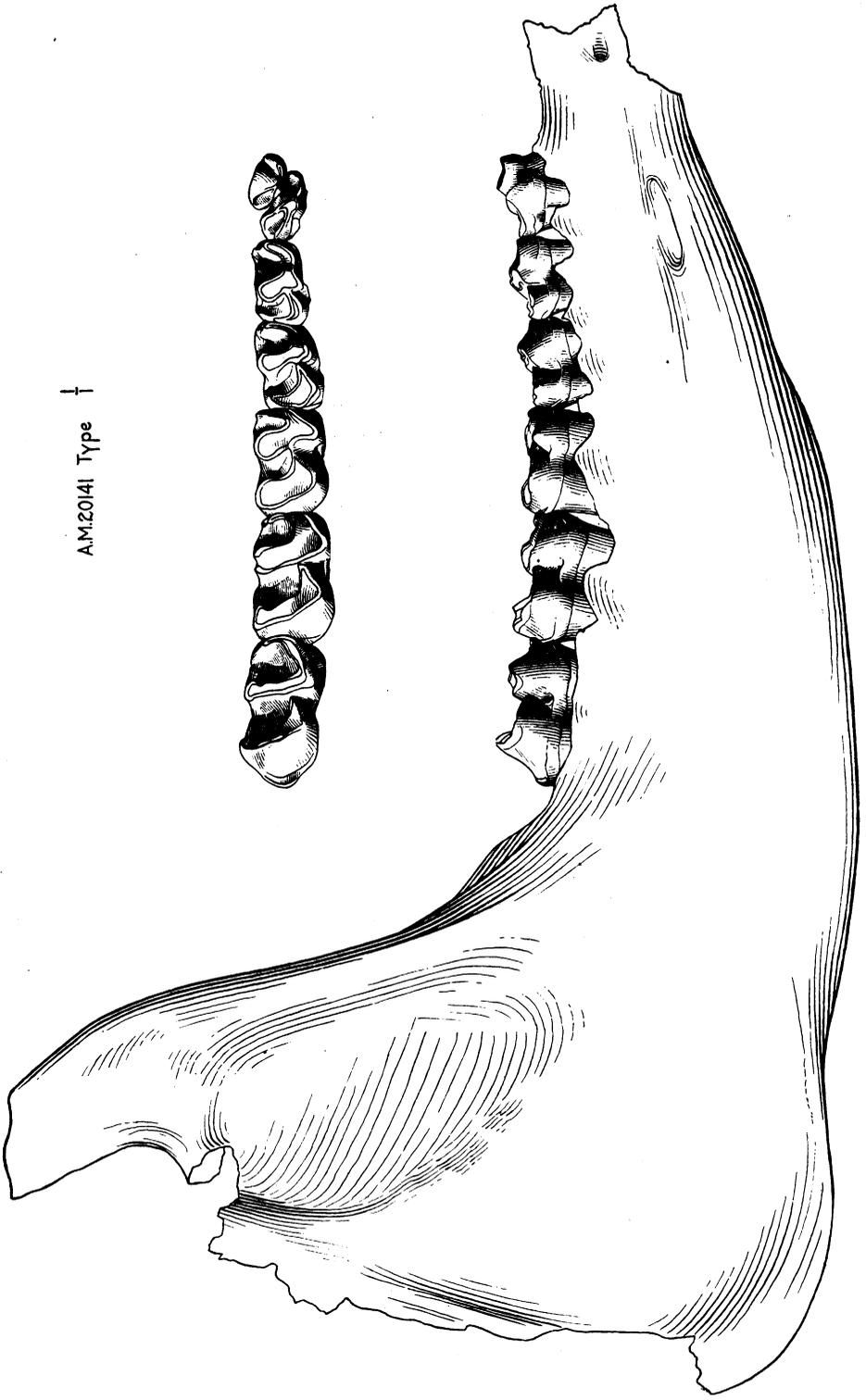


Fig. 9. *Cenolophus proficiens*. Lower jaw, external view, and crown view of teeth. Type specimen, No. 20141. Natural size.

first to third, posterior crest of m_3 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; p_1 in type two-rooted and crowded so as to be mainly internal to p_2 instead of anterior to it (probably abnormal—in No. 20140 it is one-rooted and not displaced).

Two isolated upper teeth, probably dp^3 and m^2 , 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 i_2 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 Hyracodontidæ. It is not nearly related to *Lophialetes*, or to *Desmatotherium*.

