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THE FAUNA OF THE HOULDJIN GRAVELS[1]

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The first discovery of *Baluchitherium* in Mongolia, as reported from the field by Andrews and Granger and published by Osborn in Asia Magazine and elsewhere, was in the Houldjin gravels near Iren Dabasu on the Kalgan-Urga caravan trail. The remains were very fragmentary and the identification wholly provisional. The geologic relations were described by Berkey and Granger in Novitates No. 42, p. 4. Granger's field identifications have now been revised by comparison of the material in the Museum, with the following results:

Field Identifications	Museum Identifications
1. A rhinocerid	? *Cænopus* or *Præceratherium* sp.
	? *Cadurcotherium* sp.
2. A large carnivore	*Entelodon dirus*
3. An artiodactyl of size of Virginia deer	? *Entelodon* sp.
4. An enormous mammal, probably a perissodactyl and possibly related to or identical with *Baluchitherium*	? *Baluchitherium*
5. A tortoise of large size	? *Testudo*

This fauna is of Oligocene age but cannot be more exactly correlated until more completely known. It may be coëval with the Hsanda Gol fauna but as there is nothing in common save the very doubtfully identified *Baluchitherium*, it would not be safe to correlate it at present. The localities are more than a thousand miles apart and the character of the two formations quite different. It is more like the Ardyn Obo fauna; *Cadurcotherium* is probably the same. It compares also with the fauna described by Borissiak from the Turgai Oligocene.

Entelodon dirus, new species

TYPE.—No. 19181, last upper molar from Houldjin gravels, Iren Dabasu, Mongolia.

DIAGNOSIS.—Size of *Dinohyus hollandi* but cusp construction more as in the gigantic Oligocene entelodonts; the posterior part of the molar much reduced, with small subequal metacone, metaconule and hypocone, the last set upon a wide but

[1]Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 16.

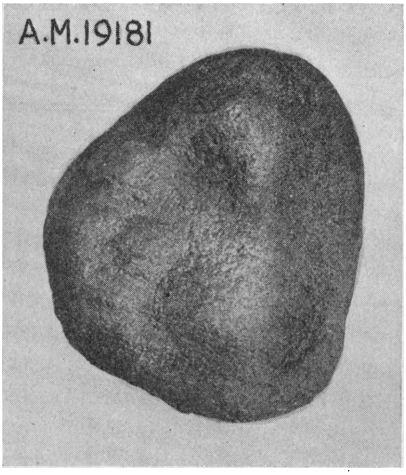

Fig. 1. *Entelodon dirus*, upper molar, m^3, right side, crown view. No. 19181, type. Houldjin gravels, Expedition of 1922. Natural size.

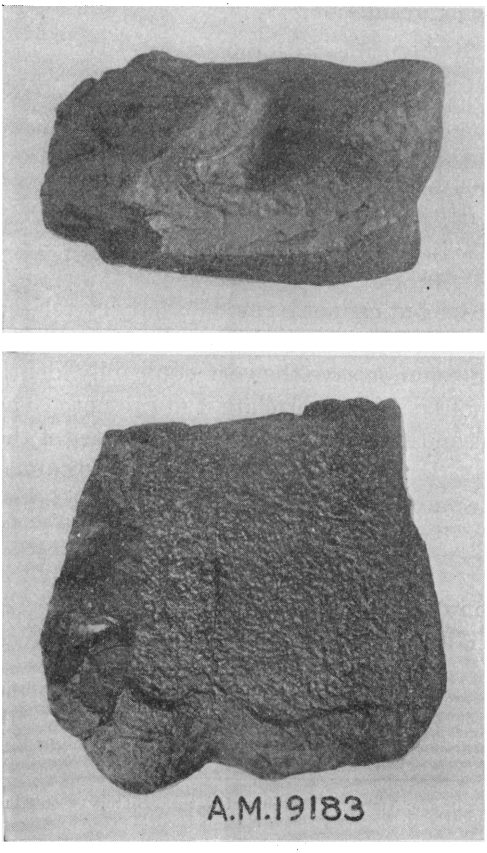

Fig. 2. *Cadurcotherium* sp., left lower molar, anterior end broken, crown and external views. No. 19183, Houldjin gravels, 1922. Natural size.

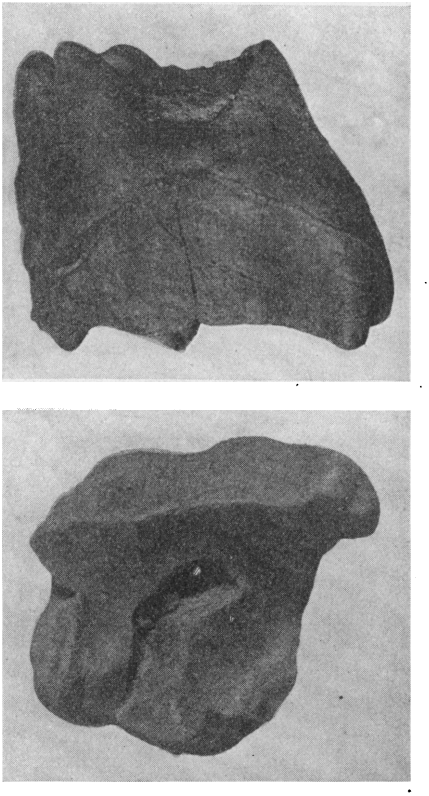

Fig. 3. *Cadurcotherium* ? right upper molar, external and crown views. Houldjin gravels, 1922. Natural size.

obscure posterior cingulum. Exterior cingulum narrow but distinct; anterior cingulum broad and well defined; paracone and protocone large, equal, the paracone with obscure anterior and posterior ridges and a rather more distinct ridge connecting it with the protocone. Protoconule quite vestigial.

The reference to *Entelodon* is in a broad sense, used as including the entire group of closely related genera or subgenera: *Archæotherium*, *Dæodon*, *Pelonax*, *Dinohyus*, *Megachœrus*, etc. It is not close to the typical *Entelodon magnus* of the Ronzon Oligocene nor to *Dinohyus* of the Lower Miocene of Nebraska. It agrees well enough with *Archæotherium* of the American Lower Oligocene except for its larger size, and with *Megachœrus* of the *Protoceras* beds (Upper White River) of South Dakota. It is not so close to the John Day entelodont "*Chœrodon*."

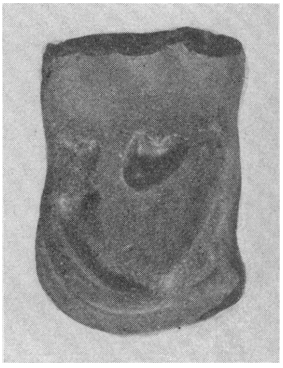

Fig. 4

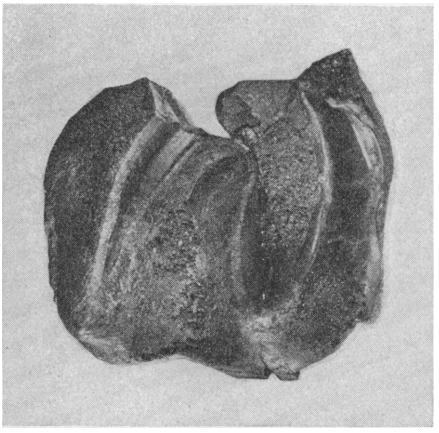

Fig. 5

Fig. 4. *Cadurcotherium*, upper premolar, crown view. Houldjin gravels, 1922. Natural size.

Fig. 5. *Cænopus* or *Præaceratherium*, upper molar, m^3, right side, crown view. Houldjin gravels, 1922. Natural size.

The remaining "genera" of this group are not comparable, as their upper molars are unknown (*Pelonax, Dæodon, Boöchœrus*).[1]

In addition to the type species we refer provisionally to this genus a canine tooth and an astragalus, which, if correctly referred, represent a smaller species; but there is little to distinguish the astragalus from that of the anthracotheres, and the canine from that of the large amphicyonids, etc.

Cadurcotherium species

No. 19183, an incomplete lower molar, is referred to this genus. It is about the size of *C. cayluxi*, with which it accords in characters. A premolar also probably belongs here, and an anterior upper molar, m^1 or m^2.

Cænopus or **Præaceratherium** species

No. 19184, upper molar tooth, m^3, may be referred to this genus provisionally. It indicates a species of about the size of the larger individuals of *C. occidentalis*, and in about the same stage of molar evolution,

[1]The entire range of variation among these typical entelodonts is not wider than among many single genera of bunodont mammals, e. g., *Phenacodus*. As Sinclair has recently shown, there is a wide range of individual variation in teeth of this type.

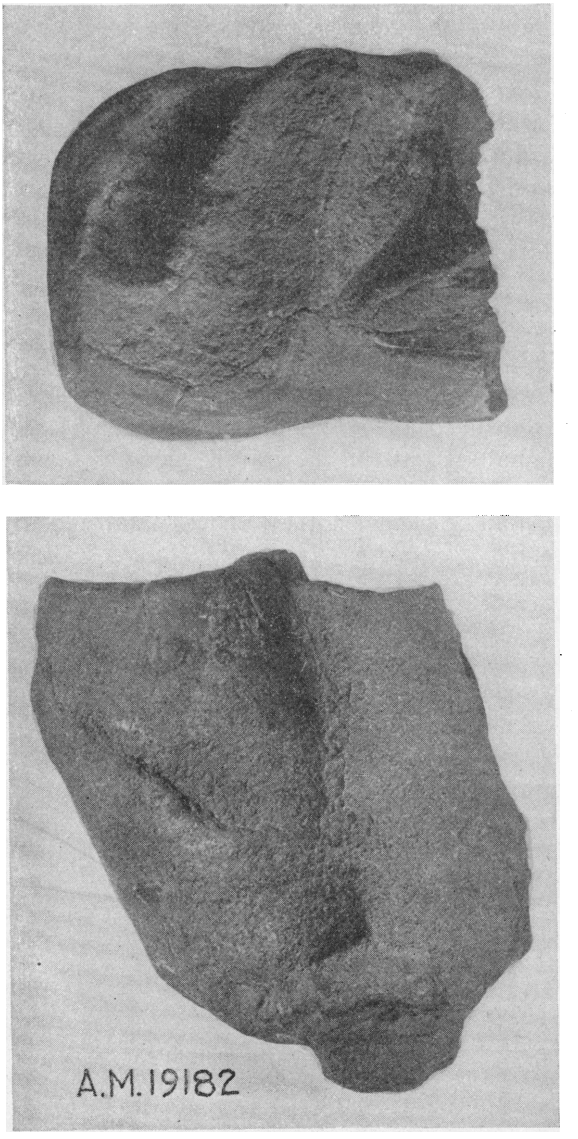

Fig. 6. *Baluchitherium* ? lower molar, crown and external views. No. 19182, Houldjin gravels, 1922. Natural size.

but is somewhat more quadrate in form. No certain reference can be made in absence of the anterior teeth. Other species of *Cænopus* and *Trigonias* among the American rhinoceroses, as also *Aceratherium filholi* Osborn and *Ronzotherium reichenaui* Deninger, show this subquadrate form in m^3, which appears to be a rather variable species character. Both these European species are placed by Abel under *Præaceratherium*. Borissiak[1] has described under the name of *Epiaceratherium turgaicum* a small rhinoceros with which the Houldjin species may prove to be identical, at least generically.

?Baluchitherium

No. 19182, a lower molar and fragments of other teeth indicate a gigantic rhinoceros of size appropriate to Cooper's genus. A few very fragmentary remains of the skeleton, No. 19180, are of comparable size. These were found scattered in the gravels, along with equally fragmentary remains of smaller perissodactyls, presumably including the *Cadurcotherium* and *Cænopus* noticed above; also some fragments of a large tortoise.

[1]Borissiak, 1918, Mem. Soc. Pal. Russie, I, pp. 1–82, Pl. I–III.