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# On the remains of a Lophiodontoid ungu- late from the Oligocene deposits of Turgai.

By **A. Borissiak.**

Объ остаткахъ лофидонтоидной формы изъ олигоценовыхъ  
отложений Тургайской области.

**А. Борисьякъ.**

Amongst the remains of oligocene mammals discovered in the recent years in Asia the fauna of the Indricotherium-beds of the Turgai region stands somewhat apart: although connected with the Indian fauna by its giant *Rhinocerotidae*<sup>1</sup>, this fauna, poor in general, contains the representatives of groups absent in the former. The most interesting of these is presented by a fragment of the upper jaw of a small Perissodactyl with four teeth preserved bearing the characters of the fam. *Lophiodontidae*, judging by the concave metacone of the exterior ridge and the relation of the transverse ridges to the exterior cusps<sup>2</sup>.

? *Colodon orientalis* n. sp.

The teeth mentioned (fig. 1a, b) present P<sup>4</sup>—M<sup>3</sup> of the right side, quite untouched by wear; the structure of all of them follows the same plan (P<sup>4</sup> has reached nearly complete molarization) being

<sup>1</sup> A. Borissiak, Bull. Ac. Petr., 1915, p. 781; 1916, p. 349; 1917, p. 287; CR, v. 162, № 14, 8 avr. 1916.

Forster Cooper, Ann. Mag. N. H., (8), VIII, p. 710; XII, p. 376 a. 504.

<sup>2</sup> Ch. Depéret, Chasmothereium, Bull. Soc. Geol. France, IV, 1904, p. 572.

characterized by a short (brachyodont) crown, the exterior ridge of which is distinctly separated into two cusps: the anterior one (paracone) is large, convex exteriorly, with anterior and posterior keels which form a slightly reentering angle, more or less bent forwards with its apex—in the anterior teeth more than in the posterior; the posterior cusp (metacone) is of smaller size, concave exteriorly and removed from the margin nearer to the middle part of the crown, these characters becoming stronger expressed from  $P^4$  to  $M^3$ . The transverse ridges are fully formed and terminate at the interior ends by coniform cusps from which small flat keels are



Fig. 1.

given off posteriorly and exteriorly; these interior cusps (protocone, hypocone) are somewhat taller than the exterior ones in  $M$ , and lower—in  $P^4$  (deuterocone, tetartocone); the exterior ends of the transverse ridges are slightly bent backwards and unite—the anterior with the anterior keel of the paracone, and the posterior—with the apex of the metacone. The cingulum is well developed; at the antero-external angle it rises in the shape of a flat tubercle (parastyle?) and also forms a high ridge on the postero-external angle (metastyle?) on account of which the outer wall of the tooth is longer than the inner, and the paracone with the parastyle inclining against it dominates on the crown—on the exterior wall of the tooth—, whereas the metacone hardly at all elevates above the posterior ridge named (fig. 1*a*).

## Measurements:

	Length.	Breadth.	Height.
P <sup>4</sup> . . . . .	13	16.3	8.5—6.5 mm.
M <sup>1</sup> . . . . .	15	16.7	9 —6 "
M <sup>2</sup> . . . . .	18	19.5	8.5—9 "
M <sup>3</sup> . . . . .	17	19.5	8 —9.2 "

## Peculiarities in the structure of the separate teeth:

P<sup>4</sup> is of moderate length, elongated in breadth; its transverse ridges are closer approximated with each other than in M; the angle formed by the keels of the antero-external cusp (protocone) is sharply turned forwards; a crista is present; the postero-external cusp is relatively larger than in the remaining teeth, and rather flat than concave. The transverse ridges and their inner cusps are blunter than in M and decline considerably toward the outer ends (there is a depression between the interior and exterior cusps), whereas in M the transverse ridges do not exhibit such a declivity (more worked out); the outer and inner sides of the tooth are of equal length.

The form of M<sup>1</sup> is more elongated, the exterior cusps not so pointed; the angle formed by the keels of the antero-external cusp (paracone) is turned forward in a smaller degree, the postero-external cusp is relatively smaller, distinctly concave, further removed from the outer margin of the tooth. The parastyle is larger and closer adjacent to the paracone; the posterior ridge of the cingulum (metastyle) is dentate and forms a second posterior (exterior) valley, which is larger than the ordinary posterior one. The outer side of the tooth is longer than the inner.

M<sup>2</sup>—is the largest tooth, and the longest, all its elements being relatively larger; it retains the same characters as in M<sup>1</sup>, but the angle formed by the keels of the antero-external cusp is directed outwards; the postero-external cusp is relatively still smaller, still further removed toward the middle of the crown, and more concave. The cingulum and its elements are still more developed. The outer side is relatively still longer than the inner and slightly slopes backwards, the anterior side of the tooth being longer than the posterior.

The form of M<sup>3</sup> is still more oblique; its postero-external cusp is of still smaller dimensions presenting but a small spur on the

outer side of the fused exterior and posterior transverse ridges; the posterior ridge of the cingulum is replaced inwards, i. e. it lies not exteriorly, but behind the postero-external cusp.

As regards the systematic position of the specimen described, the most probable is the supposition that it belongs to the subfam. *Helaletidae*, the distinctive character of this family—a short and strongly concave metacone of the upper molars—being distinctly enough exhibited in our teeth. To this subfamily are referred three genera: *Heptodon*, *Helaletes* and *Colodon*, the representatives of which have hitherto been known exclusively from the North American eocene—oligocene<sup>1</sup>. The attribution of our form to the genus *Heptodon* is excluded, on account of the more primitive habitus of its premolars<sup>2</sup>; in *Helaletes*<sup>3</sup> P<sup>3</sup> and P<sup>4</sup> are already considerably molariform (this genus is insufficiently known), however even the most recent and most specialized *Colodon*<sup>4</sup> does not exhibit such molariform P<sup>4</sup>, as the series of teeth described (in *Colodon* the exterior ridge of P<sup>4</sup> does not yet exhibit the displacement of the postero-

<sup>1</sup> The European representatives of *Colodon* had been referred to this genus incorrectly as was established by the skillful analysis of the European material by Depéret (l. c., p. 578) and Stehlin (Die Säugethiere d. Schweizer. Eocäns, prt. I).

<sup>2</sup> Cope, Tertiary Vertebrata, p. 653, pl. LVIII b, fig. 4.

Osborn a. Wortmann, Fossil Mammals of the Wasatch a. Wind-River-beds, Bull. Am. Mus. N. H., v. IV, 1892, p. 127.

<sup>3</sup> Marsh, Tertiary Mammals, Am. Journ. Science, 1872, p. 218.

Scott, On Desmotherium a. Dilophodon, Contributions E. M. Museum of Geology, Princeton College, 1883.

Osborn a. Wortmann, l. c., Bull. Am. Mus. N. H., IV, 1892, p. 130.

Wortmann a. Earle, Ancestors of the Tapir etc., Bull. Amer. Mus. N. H., V, 1893, p. 179.

Hatcher, Recent a. fossil Tapirs, Am. Journ. Science, 1896, p. 177.

Stehlin, Die Säugethiere d. Schweiz. Eocäns, I, 1903, p. 65—6.

Depéret, Chasmotherium, Bull. S. G. France, IV, 1904, p. 58.

<sup>4</sup> Marsh, Amer. Journ. Science, XXXIX, 1890, p. 524.

Wortmann a. Earle, Ancestors of the Tapir, Bull. Am. M. N. H., V, 1893, p. 173.

Osborn a. Wortmann, Perissodactyls of White-River, 1895, p. 362.

Stehlin, l. c., p. 64.

Hatcher, Recent a. Fossil Tapirs, Am. Journ. Science, 1896, p. 169.

external cusp toward the middle of the crown); however, the molars of *Colodon* manifest considerable likeness to the teeth of our form not only in the structure of the crown, but in its dimensions as well; in the majority of specimens of this genus, however, the transverse ridges are not arranged so obliquely, and only in the tooth represented by Hatcher<sup>1</sup> are the ridges more obliquely arranged, approaching the teeth of our form in position; besides, it is probable that M<sup>3</sup> of the American forms differs less from M<sup>2</sup> (the triangularity of its form is not so sharply expressed)<sup>2</sup> and, lastly, in the American forms the cingulum (its posterior ridge) is less developed,—Wortmann and Earle<sup>3</sup> alone mark the strong development of the postero-external cingulum—whereas in the teeth described the morphological significance of this ridge is so great that it, may be, already deserves to be named the metastyle<sup>4</sup>.

Therefore, if it is impossible to refer the specimen described to the genus named without hesitation, its relation to some very closely allied genus stands beyond all doubt.



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<sup>1</sup> L. c., pl. III, fig. 4.

<sup>2</sup> Osborn & Wortmann, l. c., Bull. Am. Mus. N. H., v. IV, 1892, p. 175, fig. 7.

<sup>3</sup> L. c., p. 175.

<sup>4</sup> Osborn, Evolution of molar teeth, p. 70.