

THE DISCOVERY OF A NEW FOSSIL TAPIR IN OREGON

A FAIRLY complete phylogenetic series of early Miocene tapirs has been made known to science through the researches of Messrs. Wortman,¹ Earle, and Hatcher.² Between these ancestral forms, referable to the genus *Protapirus*, and the living species is a gap in the line of descent which has remained unbridged until the fortunate discovery of the form presently to be described.

Our knowledge of the tapir phylum since the White River epoch may be summarized in a few words. In 1873, Dr. Joseph Leidy³ described under the name *Lophiodon oregonensis*, two imperfect superior molars obtained by Professor Thomas Condon at Bridge Creek, Oregon. Two species have been described by Professor Marsh,⁴ which he refers to the genus *Tapiravus*: *T. rarus* from the Loup Fork of the Rocky Mountains, and *Tapiravus validus* from the Miocene of New Jersey. From the brevity of the description and the lack of figures, these species are practically indeterminate. Remains of tapirs belonging to the existing genus are known from the Quaternary gravels of California,⁵ and have been described from several localities in the eastern states.

During the summer of 1900, Professor John C. Merriam and Mr. V. C. Osmont, of the University of California, while collecting in the fossil beds of the John Day valley, Oregon, obtained

¹ J. L. WORTMAN and C. EARLE, "Ancestors of the Tapir from the Lower Miocene of Dakota," *Bull. Am. Mus. Nat. Hist.*, Vol. V, p. 159.

² J. B. HATCHER, "Recent and Fossil Tapirs," *Am. Jour. Sci.*, 4th ser., Vol. I, p. 161, 1896.

³ U. S. Geol. Surv. of the Territories, Vol. I, p. 219, Pl. II, Fig. 1.

⁴ O. C. MARSH, *Am. Jour. Sci.*, Vol. XIV, p. 252, 1877.

⁵ J. D. WHITNEY, "Auriferous Gravels," *Mem. Mus. Comp. Zool.*, Harvard, Vol. VI, p. 250; W. P. BLAKE, *Am. Jour. Sci.* Vol. XLV, p. 381.

the bones which form the subject of the following discussion. The remains are from the *Promerycochærus* horizon (Upper John Day) exposed on the bank of the John Day river, beneath the Columbia basalt, to the west of Spray post-office, Wheeler county, Oregon. In a recent paper,¹ Professor Merriam named the beds of the Upper John Day the *Paracotylops* beds, basing the name on the new genus *Paracotylops*, proposed in the same paper by Dr. W. D. Matthew for the typical Oreodonts of this horizon. In the numbers of the *American Journal of Science* for last December and January, a paper by Mr. E. Douglass appeared in which these Oreodonts were provisionally named *Promerycochærus*. Neither Professor Merriam nor Dr. Matthew read this article before the publication of Professor Merriam's paper, and consequently did not notice the new name. It now appears that *Promerycochærus* should be retained as a generic name, and consequently, at Professor Merriam's suggestion, the name of the beds of the upper division has been changed from *Paracotylops* to *Promerycochærus* beds.

The type specimen (No. M 934, Univ. of Cal. Pal. Mus.) comprises several superior incisors; the lower jaw lacking the posterior portion, with representatives of all the inferior dentition excepting the canines and the third molar; the proximal portion of the left humerus; the left radius; the scaphoid, lunar, magnum, and unciform of the right carpus; three metacarpals of the same side, and a few phalanges. The bones are those of a single individual of a new species of the genus *Protapirus*, for which the name *Protapirus robustus* is proposed. It is considerably larger than any of the White River species of *Protapirus*, and would approximate in size the most specialized living tapir, *Elasmognathus bairdii*. The lower jaw is represented about one-half natural size in Fig. 1. The symphyisial region was found in place, imbedded in a buff colored tuff so characteristic of the Upper John Day beds that the expression "buff beds" was used as a convenient field term for this horizon. The other bones lay loose on the surface in the immediate vicinity.

¹"A Contribution to the Geology of the John Day Basin," *Bull. Dept. Geol., U. of Cal.*, Vol. II, No. 9, p. 296; *JOUR. GEOL.*, Jan.-Feb., 1901, p. 72.

The dentition.—The superior incisors are larger than the corresponding teeth in *Elasmognathus bairdii*. The inferior incisors are slightly smaller than the superior. Both series have the crowns somewhat cupped, especially so in the superior incisors. The first and second inferior incisors are of equal size, while the third is two-thirds as large as those preceding it. The crowns of both canines are broken off, but the diameters of their roots, measured on the alveolar borders, are greater than the corresponding parts of the larger incisors. A long diastema succeeds the canines. The premolars have their anterior cusps united into transverse ridges, slightly notched at the summit. In all



FIG. 1.

except the second premolar, the ridges are perpendicular to the long axis of the jaw. They are equally developed on the third and fourth premolars. Posterior cross crests are not developed on any of the premolars. In the second premolar, the protoconid is larger than the deutoconid and is situated farther forward than the latter. In the succeeding premolars, these cusps are of the same size and are situated directly opposite each other. The tetartoconid of the premolars is smaller than the metaconid. The latter cusp is united with the inner side of the base of the protoconid by a ridge. This structure is also found in the molars, all of which have two cross crests. The posterior crest in the first and second molars is somewhat oblique to the axis of the jaw. The third molar is too imperfectly preserved to describe. Anterior and posterior cingula are present on all the molars and premolars. Traces of an external cingulum are found at the outer end of the transverse valley in all except the second premolar. In this tooth the paraconid is very large, uniting by a ridge with the protoconid. In the remaining premolars the paraconid is replaced by a style rising but little above the level of the anterior cingulum.

The jaw.—The inferior border of the jaw is parallel with the alveolar border. The symphyseal portion rises at a low angle, much less than in the tapir. The flatness of this angle is perhaps due in part to a slight amount of crushing which the specimen has sustained. The posterior border of the mental foramen is directly below the anterior border of the second premolar.

The fore limb.—The humerus and radius have about the same shape as in the tapir. The deltoid ridge of the former is broken off, so that it is impossible to say whether it was hooked or not. The shaft of the radius is more strongly curved than the corresponding element in *Protapirus validus* as figured by Hatcher,¹ but a part of the curvature may be due to distortion. The carpus does not call for special description, not differing materially from that of *Protapirus obliquidens*. W. & E. The anterior contact of the lunar and magnum is still small, as in the White River species. There were four digits in the manus, the length of metacarpals III, IV, and V being about the same as in *E. bairdii*, but less robust. In shape they correspond closely with the metacarpals of the latter, except that the proximal portion of the fifth is inclined at a greater angle to the shaft of the bone than in the living form. The phalanges, which are of the second row, are shorter and less robust than those of the tapir.

Phylogenetic position.—The remains just described indicate an animal much larger than any of the White River species of the same genus. The structure of the molars and premolars suggests *Protapirus validus* as a probable ancestor. There are, however, several differences. In addition to the considerable difference in size, the third premolar of *P. robustus* has the anterior cross crest vertical to the long axis of the jaw, while in *P. validus* it is somewhat oblique. The diastema, as in *P. validus*, is shorter than in *Elasmognathus*, while the mental foramen has moved slightly posterior to the position it occupies in the White River ancestor. Gradations between the two types probably occur among the as yet unknown tapirs of the Lower and Middle John Day.

¹ *Loc. cit.*, p. 167, Fig. 1.

MEASUREMENTS OF PROTAPIRUS ROBUSTUS

Length of inferior molar-premolar series	- - -	128 to 130 ^{mm}
Length of inferior premolar series	- - - - -	60
Length of inferior molar series (approximate)	- - - - -	70
Length of diastema	- - - - -	46
Length of symphysis measured on lower side	- - - - -	71
Depth of ramus below alveolus of Pm. 2	- - - - -	48
Depth of ramus below alveolus of Pm. 4	- - - - -	49
Depth of ramus below alveolus of M. 3	- - - - -	43+
Length of radius	- - - - -	181
Breadth of proximal end of radius	- - - - -	45
Breadth of distal end of radius	- - - - -	39

In this connection, may be mentioned a second specimen, (No. M 1525 University of California Pal. Museum), representing probably another new species, obtained by the writer in the uppermost beds of the John Day system, on Johnson Creek, Grant county, Oregon. The horizon is considerably higher than that from which *Protapirus robustus* was obtained, and appears to be faunally distinct. It is characterized by the remains of numerous individuals of a camel belonging to the genus *Protomeryx* and by a rodent generically new. The tapir remains are of a young animal and are not complete enough to characterize specifically. They comprise fragments of a jaw with which three incisors and the second inferior premolar are preserved. The two large incisors, apparently the inferior median pair, are two-thirds as large as the corresponding teeth in *P. robustus*. They are spatulate in shape and slightly cupped. The anterior face is marked by delicate growth lines. The third incisor is an exceedingly small tooth with the crown $3\frac{1}{2}$ ^{mm} broad. Imperfect preservation of the symphyseal region renders it impossible to make any statement regarding the canine. The second premolar of the right side is the only one of the cheek teeth perfectly preserved. This tooth is entirely unworn, and was just appearing through the gums at the time of the animal's death. In this tooth, the tetartoconid is much larger than in *P. robustus* and the junction of the metaconid with the tetartoconid is much more complete, forming a cross crest but slightly notched. A ridge

joins the former cusp with the middle of the anterior cross crest. The protoconid is considerably anterior to the deutoconid and as in *P. robustus* is united with the paraconid by a ridge. The anterior cross crest is sharply notched, but this structure would probably assume the character of the anterior cross crest in *P. robustus* with the wearing down of the deutocone by use. External cingula appear at the outer margin of the median valley and on the external side of the paraconid. A posterior cingulum is also developed.

MEASUREMENTS

Width of the crown of first inferior incisor	-	-	-	-	-	9½ mm
Width of the crown of third inferior incisor	-	-	-	-	-	3½
Length of the first premolar crown, antero-posteriorly	-	-	-	-	-	15½

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