

ART. XXVII.—*The Status of Homogalax, with Two New Species*; by EDWARD L. TROXELL.

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*Homogalax* Hay constitutes a genus of odd-toed animals whose relationship to the early horses is both near and confusing. The older genus *Systemodon* Cope has been broken up, part going to form this newer genus, and part, including the genoholotype, being put under *Hyracotherium* Owen, one of the earliest of the Equidæ.

In 1875,<sup>1</sup> Cope made the species *Orohippus tapirinus*, which in 1877<sup>2</sup> he referred to *Hyracotherium*; in 1881<sup>3</sup> he made the distinct genus *Systemodon* for it, because he concluded from a study of additional material that the species showed the lack of a diastema, a new feature.

It is necessary to disregard Cope's later descriptions and figured specimens in attempting to determine what *Systemodon* and its type, *S. tapirinus*, really are, and the fragmentary character and limited amount of the holotype make accurate comparison impossible. Strangely enough, neither the original type nor any of the later referred specimens exhibit the feature on which the genus was supposed to be based.

In 1896<sup>4</sup> Wortman placed the species *S. tapirinus* again under *Hyracotherium*, which he considered a synonym of *Eohippus* Marsh. Hay therefore in 1899<sup>5</sup> proposed the name *Homogalax*, type "*S.*" *primævus* Wortman, and intended to have it include the species *S. semihians* Cope. There is ample justification for the erection of this new genus because of the imperfection of the holotype of *S. tapirinus* and because of fundamental differences, especially in the form of  $M_3$  as judged from other material; but on account of the presence of diastemata, the small heel on  $M_3$ , and for other reasons, "*S.*" *semihians* can not be included in *Homogalax* Hay. It appears, moreover, that this species belongs to no known genus.

<sup>1</sup> E. D. Cope, Systematic catalogue of Vertebrata of the Eocene of New Mexico. U. S. Geog. Surv. W. 100th Merid., p. 20.

<sup>2</sup> E. D. Cope, U. S. Geog. Surv. W. 100th Merid., 4, Palæontology, p. 263, pl. 66, figs. 12-16.

<sup>3</sup> E. D. Cope, Amer. Nat., 15, 1018.

<sup>4</sup> J. L. Wortman, Bull. Amer. Mus. Nat. Hist., vol. 8, 94-95, 1896.

<sup>5</sup> O. P. Hay, Science, new ser., 9, 593, 1899.

Cope's referred specimen, "*S. tapirinus*"<sup>6</sup> may belong to *Homogalax* cf. *H. primævus*. It is, in my opinion, not of *Systemodon*. Likewise the specimen referred to *H. tapirinus* by Wortman is clearly not of that species.

There is no doubt a close relationship between all these genera, including *Hyracotherium* and the early horses. *Homogalax* is separated from these allies by the total absence of a diastema, the lack of distinct tubercles on the cross lophs of the molars, and the general peculiar shape of the molars themselves.

*Homogalax primævus* (Wortman) is the genoholotype, from the Wasatch beds. The two new species made in the pages following are from the Bridger and Uinta, thus the three forms represent the lower, middle and upper Eocene respectively.

*Homogalax bridgerensis*, sp. nov.

Holotype, Cat. No. 12563, Y. P. M. Eocene (Bridger), Twin Buttes, Wyoming.

(Figs. 1-2.)

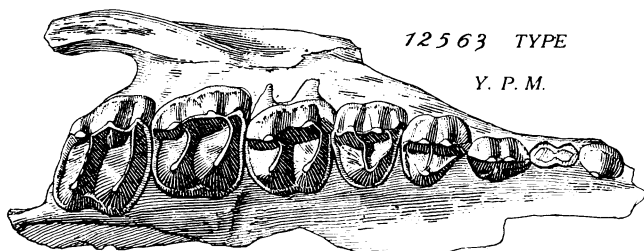


FIG. 1.—*Homogalax bridgerensis*, sp. nov. Holotype. Right maxillary with molars, premolars, and canine. Note especially the absence of a diastema, the oblong  $M^3$ , subquadrate  $M^{1,2}$ , and the narrower inner side of  $P^3$ . Nat. size.

This interesting type came to the Peabody Museum in separate shipments in 1874. It bears two distinct labels and was thought to be two individuals. Now it is found that the mandibular rami, accession No. 610, fit the maxillaries, No. 655, and furthermore, a small fragment of one of the latter was actually associated with the rami.

This new species is nearest *H. primævus* (Wortman), but differs from it in the narrower first upper molar, in

<sup>6</sup> E. D. Cope, Rept. U. S. Geol. Surv. Terr., pp. 618-624, pl. 56, fig. 1, 1884-

the presence of a distinct metaloph on  $P^3$  and the triangular form of this tooth, in the inner cusps of  $P^2$ , in the small upper canine, and in the presence of strong cingula on the outer side of the upper molars.

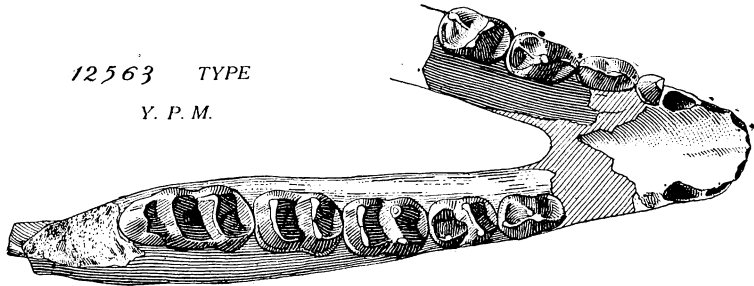


FIG. 2.—*Homogalax bridgerensis*, sp. nov. Holotype. Part of the lower jaws. Note the alveoli of the canines and incisors, and the close crowding of the teeth. Nat. size.

Both the upper and lower series of teeth, except the upper incisors which we do not know, are continuous throughout. We judge the lower canines and incisors from their alveoli. In the lower series the first and second premolars each consist of the simple protocone with ridges running to it. On  $P_3$  there is a double central cone, the true protoconid with the deuterocoid isolated from it. The fourth premolar still has the single ridge on its broad posterior heel, but the two anterior cones have separated to form a transverse crest as in the molars.

The first and second molars have the two ordinary cross-crests with the exterior extensions forward as in tapirs and rhinoceroses generally. On  $M_2$  there is a strong antero-exterior cingulum. The teeth gradually increase in size and in the separation of the cross ridges back to the third molar.

The prominent heel of the third molar amounts almost to a cross ridge in the arrangement of its two cusps. This double cusp is distinctive of *Homogalax*, as contrasted with the single one of the original *Systemodon*.

So little remains of the skull of this rare specimen that it offers few criteria for its interpretation. The orbit lies over the molars, extending to a point above the first. Unlike that of *Helaletes*, the antorbital foramen is situated forward, over the third premolar, and there is other evidence that no facial vacuity existed as in that genus.

*Homogalax uintensis*, sp. nov.

Holotype, Cat. No. 12561, Y. P. M. Eocene (Uinta), mouth of the White River, Utah.

(FIGS. 3-4.)

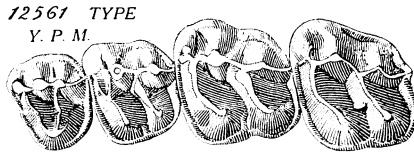


FIG. 3.—*Homogalax uintensis*, sp. nov. Holotype. Upper molars and fourth premolar of an Upper Eocene tapiroid. Nat. size.

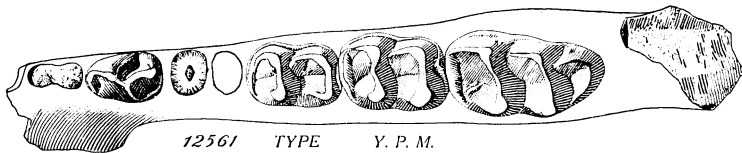


FIG. 4.—*Homogalax uintensis*, sp. nov. Holotype. Lower dentition and part of right ramus. Nat. size.

Another specimen in the Peabody Museum demands consideration, for it not only represents a new species of *Homogalax* Hay, but occurs in a totally different geological horizon from that of *H. bridgerensis* described above.

*H. uintensis*, as compared to *H. bridgerensis*, is much larger. The third upper molar is not so perfect a parallelogram in form, although it too is greatly elongated along the diagonal through the paracone and hypocone. The antero-posterior diameter is large compared to that of *H. bridgerensis*. The metaloph forms a continuous straight ridge with that part of the ectoloph leading to the paracone (antero-exterior). This cone is prominent, especially on  $M^3$ , while the double parastyle is very small. On  $M^2$  this style is much larger. Each upper molar has a minute crista and all are notable for their short posterior side.

In the lower dentition, one sees that the heel of the last molar, although broad, is not definitely divided into two cusps. The third premolar shows a distinct separation of the metaconid (or deutoconid) and sharp grooves separating the elements of the tooth.

*Summary.*

*Systemodon* Cope, an indefinite genus concerning which there is some confusion, is considered for the present, following Wortman, as a synonym of *Hyracotherium* Owen, but it is evident from the present study that both are distinct from *Eohippus* Marsh.

*Homogalax primævus* (Wortman) Hay is a species of tapiroids about the size of *Hyrachyus agrarius* Leidy; but it may be easily separated from this and from the early horses by the absence of diastemata, by the existence of a third lobe on the last lower molar, and by other generalized features. There is no evidence of a facial depression like that of *Helaletes*.

Two new species are here proposed: *Homogalax bridgerensis* and *H. wintensis*; these, together with *H. primævus*, the genoholotype, represent three localities distinct geologically and geographically. *H. bridgerensis* may be distinguished by the triangular P<sup>3</sup> with distinct metaloph, the small canine, the absence of diastema and the geological age. *H. wintensis* is notable for its larger rounded teeth, double parastyle and late Eocene age.

*Measurements.*

	<i>H. bridgerensis</i> 12563, Y.P.M. mm.	<i>H. wintensis</i> 12561, Y.P.M. mm.
Upper dentition		
Length of molar-premolar series . . . .	68	
Length of molar series . . . . .	38	44.5
Lower dentition		
Length of P <sub>3</sub> to M <sub>3</sub> inc. . . . .	58.3	68.3
Length of molar series . . . . .	41	47.3