Art. XL.—*The Apatemyidæ;* by Edward Leffingwell Troxell.

[Contributions from the Othniel Charles Marsh Publication Fund, Peabody Museum, Yale University, New Haven, Conn.]

Authors have assigned *Apatemys* Marsh, and the associated genera making up the family as now known, to the Insectivora on the basis of the diminutive size, the large incisor, the position of the mental foramen, situated far back on the side of the ramus, and the high trigonid. In so far as the order of the insectivores is made up of such an extremely varied group, to which are assigned so many genera of uncertain position, this classification may serve temporarily.

Uintasorex and *Trogolemur* Matthew have been added to this family by their nomenclator (1909, p. 543), who points out the striking resemblance between certain primates, viz., the Tarsiidae, and *Trogolemur, Apatemys bellulus,* and *Uintasorex,* on the one hand; and a possible derivation of *Phenacolemur* and *Apatemys bellus* from some other stock (1915, p. 478; see also 1917, p. 837).

Fig. 1.

Fig. 2.

Figs. 1, 2.—Crown and side views of jaw of *Apatemys bellus* Marsh. Holotype. Cat. No. 13512, Y. P. M. × 2¼.

Marsh's original descriptions of *Apatemys bellus* and *A. bellulus* are as follows (1872, p. 221):

"*Apatemys bellus,* gen. et sp. nov.

[Figs. 1, 2.]

"A new and peculiar genus of very small mammals may be based on part of a lower jaw, with the penultimate molar in place, and well preserved. Extending through the base of the specimen is a portion of a large rodent-like incisor. The molar is of the insectivore type, and the animal should probably be placed with that group. The crown of this tooth has its posterior half deeply excavated, with the outer rim of the cavity the highest, and rising at the inner posterior angle into a pointed tubercle. The anterior half of the crown consists of a transverse pair of high pointed cusps, opposite each other, and con-

nected together. An elevated basal ridge, rising into a sharp inner cusp, completes the anterior margin. The large incisor is oval in transverse section, and extends under all the molars. The animal was about as large as a mole.

"*Measurements.*

"Antero-posterior diameter of penultimate lower molar	2.3	mm.
Transverse diameter	2.	"
Depth of jaw below	5.6	"
Transverse diameter of incisor	1.6	" ."

FIG. 3.

FIG. 4.

FIGS. 3, 4.—Crown and side views of ramus of *Apatemys bellulus* Marsh. Holotype. Cat. No. 13513, Y. P. M. × 2¼.

"*Apatemys bellulus*, sp. nov.

[FIGS. 3, 4.]

"Another diminutive mammal, apparently of the same genus, but somewhat smaller than the species last described, is well represented by a lower jaw with the last three molars perfect. The penultimate molar agrees in the composition of its crown with that of *A. bellus*. In the last lower molar, the outer border of the posterior cavity forms a slightly curved longitudinal ridge, which terminates in a small tubercle. The molar teeth are narrow, and the jaw compressed. The cavity for the incisor extends below all the lower molars.

"*Measurements.*

"Space occupied by last three lower molars	6.	mm.
Antero-posterior diameter of last lower molar	2.1	"
Transverse diameter	1.6	"
Antero-posterior diameter of penultimate lower molar	2.	"
Transverse diameter	1.7	" ."

Apatemys rodens, sp. nov.

[FIGS. 5, 6.]

Holotype, Cat. No. 12973, Y. P. M., found in July 1873 in the Bridger (Eocene) formation of the Bridger Basin by J. W. Chew.

The type consists of the heavy ramus with a proportionately large incisor but with small molars. It is evident that the animal depended largely upon the incisors

to gather its food, which needed little further attention from the ridiculously small grinding teeth. It was indeed a gnawing animal, hence the name "*rodens*"; and its habits may be compared to those of the aye-aye (*Cheiromys madagascarensis*) which eats soft fruits or gnaws into wood to get the boring parasites.

FIG. 5.

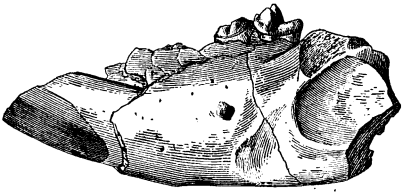

FIG. 6.

FIGS. 5, 6.—Two views of the jaw of *Apatemys rodens*, sp. nov. Holotype. Cat. No. 12973, Y. P. M. × 2¼.

This species represents a much larger animal than does the genoholotype, and is clearly a different species.

Morphology.—The molar series is represented by one complete and one broken tooth. They resemble closely the teeth of *Apatemys bellus* Marsh, genotype, but the protoconid and metaconid are more diagonally placed, are further apart, and more sharply separated. Anteriorly the paraconid forms a definite sharp cusp without a cingulum. Both the hypoconid and entoconid are represented by minute cusps on the edges of the broad heel, which is flat rather than basined. The heel of M_3 is not pointed by the addition of a hypoconulid, as in *A. bellulus*, holotype (Cat. No. 13513, Y. P. M.) (fig. 3), but yet is more narrow and more elongated antero-posteriorly than that of M_2. The alveolar border is too crushed to determine the total number of cheek teeth in the mandible, but there were probably four or five all told.

The large procumbent incisor is covered on the lower anterior surface with enamel which extends only to the alveolus below, but reaches half-way around the outer side of the tooth. It seems, therefore, to be a rooted tooth but may have been continuously growing as in the rodents.

Vertically midway on the ramus and at a point beneath M_2 lies the mental foramen. In this respect the species resembles certain of the insectivores. A very deep masseteric fossa extends only to the posterior side of M_3. Although the depression is deep, there is no prominent ridge rising above the face of the ramus, bordering it on the front side.

The beginning of the anterior border of the coronoid, a heavy ridge, lies back of the last molar. Being rather rugose instead of smooth, the outer side of the ramus suggests great musculature which may be correlated with the heavy incisor.

The symphysis was never coössified. It is marked only by a small area of roughened bone. Probably the two incisors were closely appressed and united for some distance by a bone layer.

Summary.—An unusually large species of *Apatemys* is here designated *A. rodens,* sp. nov., because of its great *gnawing* incisor. This is a feature which, although found in the rodents, shows only a structural resemblance and does not denote relationship. In the molar teeth there is a similarity to certain primates, but the animal was probably an insectivore, as Marsh first suggested.

The importance of finding complete specimens, or even good skulls alone, of the various apatemyids cannot be over-estimated. Their proper classifications and interpretation will probably depend on this.

Measurements of Holotypes.

	A. bellus	*A. rodens*	*A. bellulus*
	mm.	mm.	mm.
Depth of ramus below M_3		9.5	
Antero-posterior diameter, M_2 .	2.2		1.7
Antero-posterior diameter, M_3 .		2.8	2.0
Antero-posterior diameter, M_{1-3}			5.6
Vertical diameter (ant. post.), I	2.7	5.3	
Transverse diameter, I	1.4	3.0	

References.

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