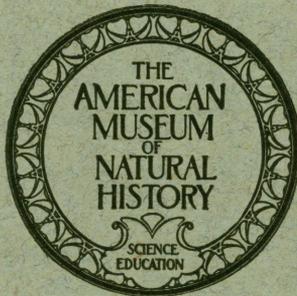


AMERICAN MUSEUM NOVITATES

No. 14

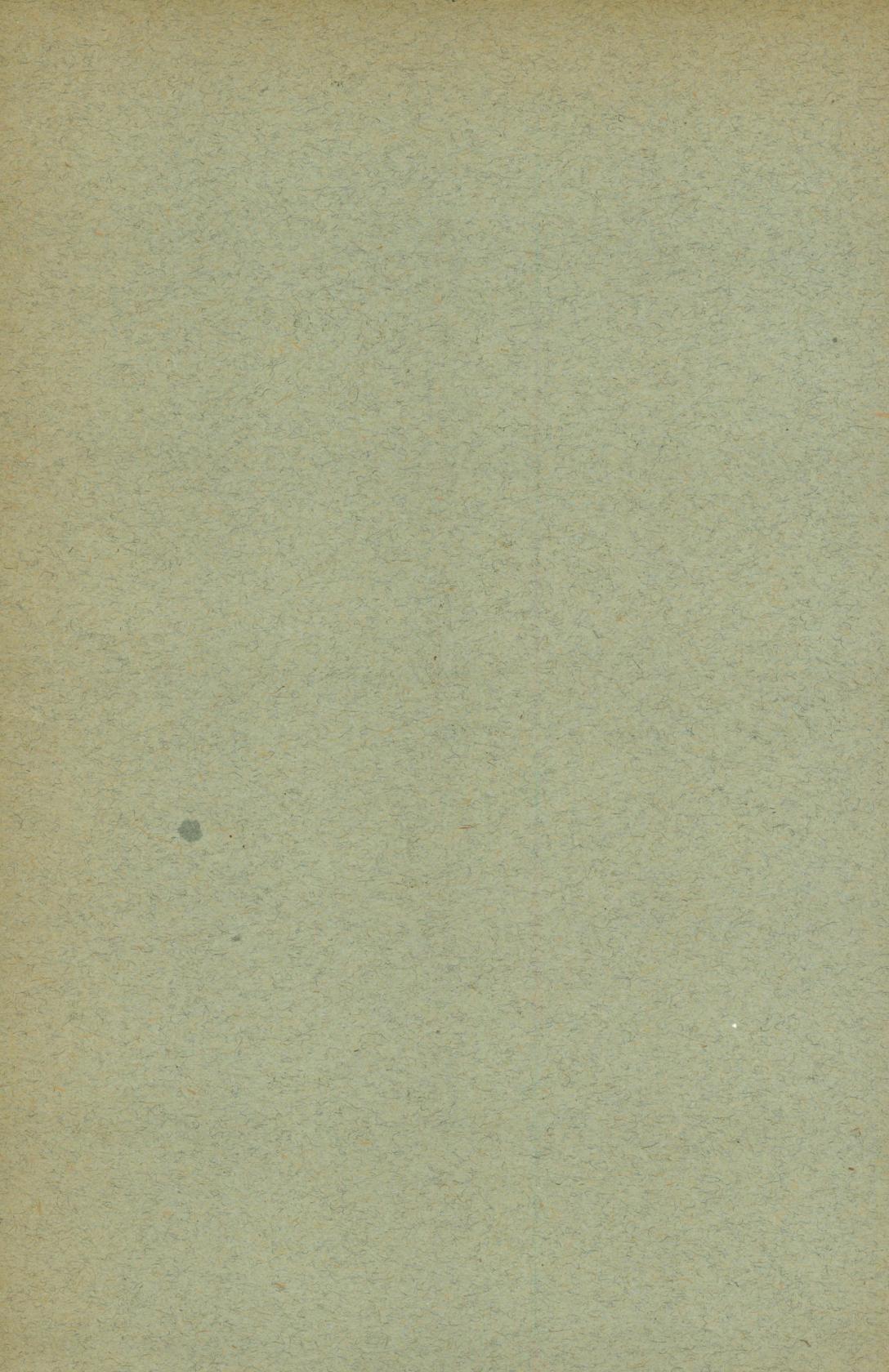
STEHLINIUS, A NEW EOCENE INSECTIVORE

By W. D. MATTHEW



Issued September 7, 1921

BY ORDER OF THE TRUSTEES
OF
THE AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK CITY



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56.9,338(1181:79.2)

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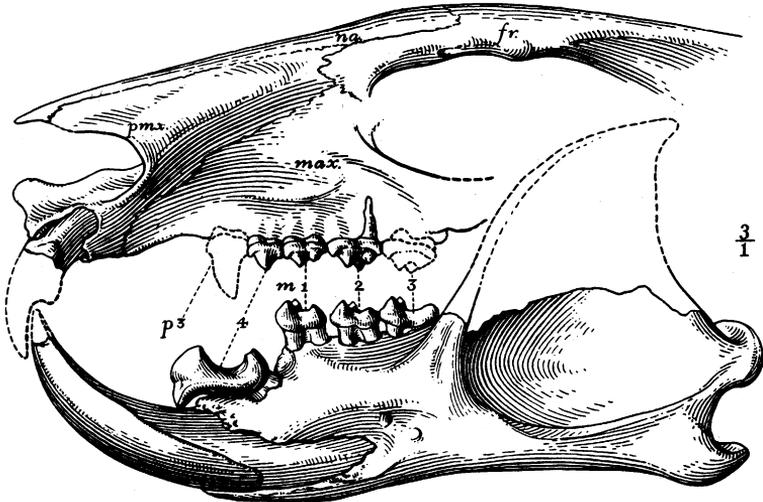
In 1895 Mr. O. A. Peterson, of The American Museum of Natural History, obtained from the Uinta basin of Utah a block of shale showing numerous fragments of small vertebrates, among which the most interesting was an incomplete and badly crushed skull and jaws of a small mammal which Dr. Wortman immediately recognized as a "new insectivore," but which has never been described. I prepared this specimen under the binoculars several years ago but withheld description, hoping to have opportunity to dissect out and reconstruct the displaced fragments of the skull. I have concluded, however, that it involved too much risk to be advisable. Miss Erna Kohlhaase worked over the large block from which it had been removed, hoping to find skeleton parts or other fragments, but, although she found a number of small rodent jaws and skeleton bones of small mammals and reptiles, there was nothing that could be confidently referred to the little insectivore. Its singular and highly specialized dentition made its affinities wholly obscure, and it was only in recent years that the researches of Stehlin upon the Plesiadapidae and the discovery of several genera of this family in the Eocene and Paleocene of this country cast some light upon its probable affinities. It now appears to be an extremely specialized plesiadapid, possibly related to *Necrosorex* Filhol. The reduction of the cheek teeth is carried further even than in *Apatemys* but, unlike that genus, a large and very remarkable cutting premolar is retained in the lower jaw. This tooth, long and knife-like, has no anterior root, the base of the crown resting upon the large front tooth; the posterior root is normal. This singular construction is explicable as due to the re-enlargement of a tooth like that of *Apatemys*, which is small, knife-like and single-rooted; or else to the progressive degeneration of the anterior root due to its being crowded out through the progressive enlargement of the front tooth.¹

¹Neither explanation appears entirely satisfactory; the former is in accord with what is actually known of the phyletic record both in this family and in the parallel case of the Plagiaulacidae; but will be sternly rejected by certain advocates of "irreversibility in evolution" who attach a very different meaning to Dollo's Law from that explained by its distinguished proponent. The mechanics of the second interpretation appear to be unsound; a slight deepening of the jaw or backward migration of the anterior root would obviate any interference from the root of the front tooth, and the anterior root of a large knife-like tooth of this description would function so importantly in keeping it firm and true that it would be wholly unlikely to degenerate and disappear if there were any way of avoiding such a loss. Once lost, of course, and the tooth dependent for its support solely upon the posterior root and such bracing as it might obtain from its proximity to the socket and root of the large tooth in front, one can understand that a re-enlargement might fail to develop a new anterior root through fusion of the posterior root, but instead permit it simply to rest against this anterior brace. In any event, the mechanics of this construction is very remarkable.

***Stehlinius uintensis*, new genus and species**

TYPE.—No. 1903. A right lower jaw, with part of the skull from the Upper Eocene (Uinta) of White River, Utah. Exped. 1895.

GENERIC CHARACTERS.—Dentition $\frac{1.0.2.3}{1.0.1.3}$. Incisors soricoid, greatly enlarged and root and crown much elongated, trihedral in cross-section, the crown of the upper incisor unknown, the lower incisor curving upward towards tip, the wearing surface on the posterior face obliquely concave, the enamel confined to the anterior face of the tooth. Third upper premolar indicated by a single rather large, oval alveolus, the form of the crown unknown. Fourth upper premolar small, trenchant, pointed.



Amer. Mus. No. 1903



Fig. 1. *Stehlinius uintensis*, skull and lower jaw, side view, type specimen, Upper Eocene, Utah.

Skull reconstructed from the crushed original, lower jaw reversed. Three times natural size.

Upper molars brachyodont, trihedral, scalene to a marked degree, paracone and metacone prominent, rounded, subequal, parastyle and metastyle well developed, but no mesostyle; protocone prominent, rounded, posterior wing absent, anterior wing extended into a crest meeting the paracone. Lower premolar enlarged, the crown compressed and elongated, with the anterior part raised into a knife-edge and the posterior part with a strong heel-cusp. The posterior root is normal, the anterior root absent, the anterior part of the crown resting upon the incisor. Lower molars with oblique crested trigonids and large basin talonids, the paraconids being low and not

prominent. Lower jaw of moderate depth, with broad coronoid process, condyle but slightly expanded transversely, angle broad, not inflected, ending posteriorly in a stout hook-like process.

Reconstruction of the Skull

The anterior part of the skull is preserved, but so broken and distorted that its reconstruction as shown in the accompanying figure is partly conjectural, and therefore not included in the generic diagnosis.

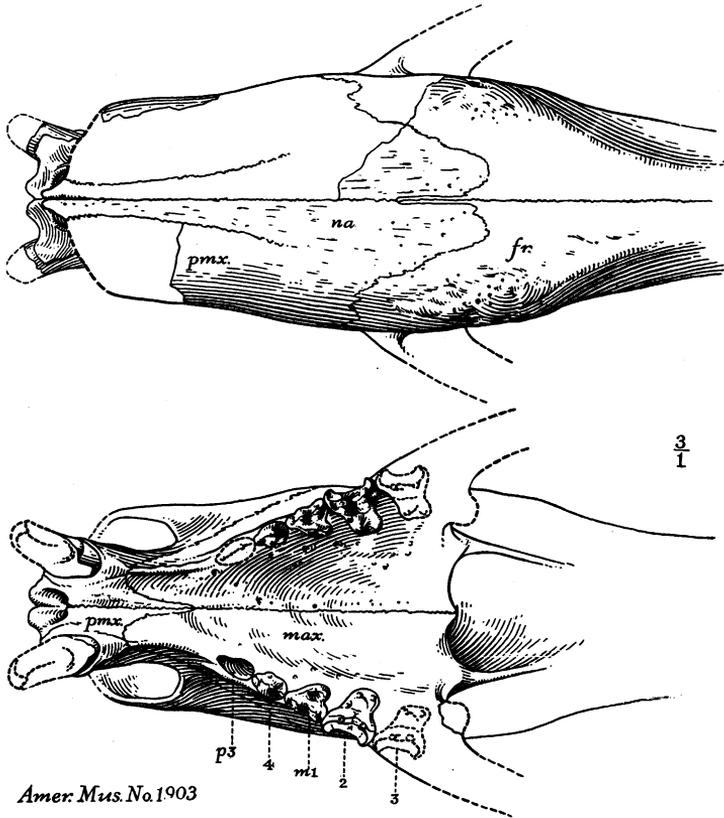


Fig. 2. *Stehlinius uintens*, type specimen.

A, reconstructed skull, top view; B, palate partly reconstructed. Three times natural size.

The reconstruction was drawn by Mr. Erwin Christman and is the final resultant of a series of critical studies and attempts at reconstructing the type skull by Mr. Christman, Dr. Gregory and the author; but it remains a tentative and not a positive resultant. The width and character

of the nasals and premaxillæ is based upon somewhat doubtful identification of the displaced fragments. The sutures, which are mostly well shown and afford the best evidence for the identity of these fragments, are indicated wherever we regard them as positively identifiable.

The most remarkable features of the skull are the great expansion of the ascending ala of the premaxilla, and the long and wide posterior overlap of the nasal on the frontal bone. This is clearly seen to be a superficial overlap, the frontal extending beneath the nasal plate as far forward as the preorbital line, and showing at the surface in a narrow thread along the median suture. In the marsupials the nasals are greatly extended and expanded posteriorly, but there is little or no overlap on the frontals except laterally in some forms (*Didelphys*, etc.).

The postorbital process of the frontals is indicated only by a slight rugosity, as in most Insectivora. The postorbital crests behind it are obscure, and the constriction not marked. The skull is broken off at about the line between parietals and frontals, but this suture is not certainly recognizable.

Owing to the broad ascending premaxillary plates, the width of the muzzle is considerable, but the body of the premaxilla is narrow, the incisors set close together, and above and partly in front of the incisor is a process and crest which may have been extended upward in a bony septum between the anterior nares, but is broken off in the specimen.

The palate is narrow at the incisors, but widens rapidly backward, with the maxillo-premaxillary suture crossing it in the middle of a moderately long diastema between the incisor and p^3 . There is some doubtful indication of another small tooth in this diastema. The posterior border of the palate is somewhat doubtfully recognized just back of m^3 .

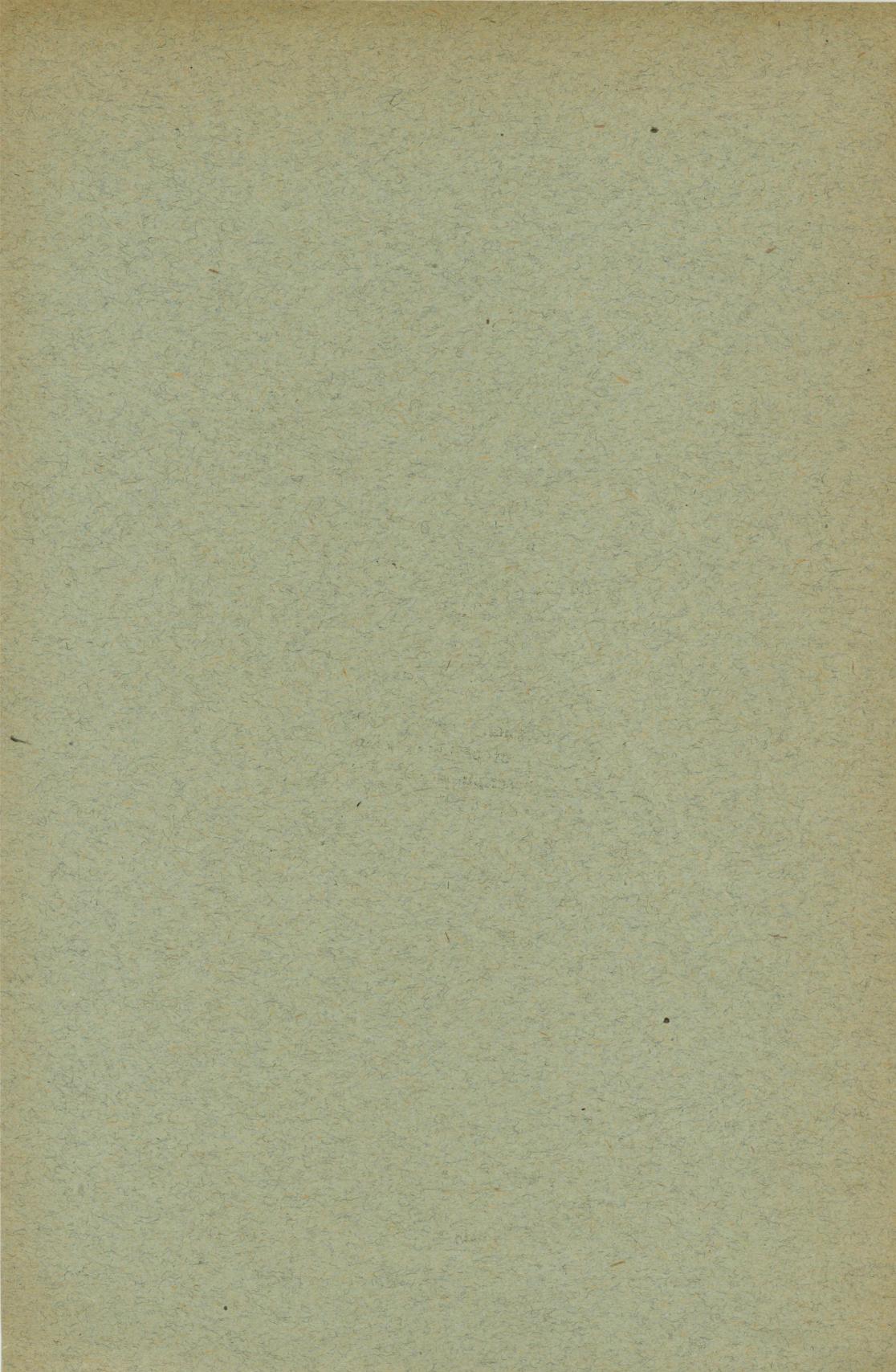
Affinities

The characters of the teeth place this genus as a specialized member of the Plesiadapidæ. It may be nearly related to *Necrosorex* Filhol, of the French Phosphorites, although clearly not identical (*Necrosorex* has one too many alveoli, even if one ignores the differences in its m_3 as due to careless drawing); and, if so, it confirms Dr. Stehlin's transfer of the Phosphorite genus from the Soricidæ, where Filhol very naturally placed it, to the neighborhood of the Plesiadapidæ; thus affording another instance of the insight of this distinguished palæontologist in recognizing the true affinities of so fragmentary and deceptive a type. It has seemed appropriate on this account that the Uinta genus should be named in Dr. Stehlin's honor.

The skull characters are not very close to those of *Nothodectes*, the only genus of this family in which anything of the skull has been described. Although the skull is badly crushed in *Nothodectes* and difficult to interpret, I cannot find in it any evidence for the backward extension and expansion of the nasals or the relatively enormous ascending plate of the premaxilla that characterize *Stehlinius* if we have correctly reconstructed this part of the skull. These are marsupial, and especially diprotodont marsupial, characters; but, as noted above, the nasal expansion in this genus is a superficial overlap, quite unlike the marsupial conditions, and probably a secondary specialization from the normal primitive insectivore type; the expanded premaxillary plate is presumably also secondary and indicates parallel adaptation, not relationship to the diprotodont marsupials. Marsupial relationship is, in fact, wholly excluded by the dentition, characters of the jaw, etc.

The new genus is referred to the Plesiadapidae chiefly upon the evidence of the teeth, and without prejudice to possible claims to relationship with *Mixodectes* or *Microsyops*, which at present are assigned to distinct families.

The ordinal position of this whole assemblage of genera is very doubtful. Stehlin regards the Plesiadapidae as chiromyoid primates; Gregory and Matthew consider them as tupaoid insectivores (Menotyphla); but in any event they stand near the boundary line between the two orders. The present genus has no especial suggestion of primate about it; but that is of little significance.



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NOVITATES**

FRANK E. LUTZ, Editor

Issued, as occasion requires, for the publication of preliminary announcements, descriptions of new forms, and similar matters.

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