

Article XX.— A PALEOCENE BAT.

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In proportion to their numbers and variety in the modern fauna, fossil Chiroptera are very little known. There are only ten or twelve extinct genera on record, and the majority of these are based on fragments of very doubtful reference. Fossil remains of modern genera, usually of species still existing, are commonly found in cave deposits; and in some of the European Tertiary formations as far back as the Upper Eocene remains of several kinds have been found, none of them very widely different from those now living.

In North America no conclusive evidence of Tertiary bats has hitherto been recorded. Marsh in 1872 referred to the Chiroptera the genera *Nyctitherium* and *Nyctilestes*, based upon fragments of jaws from the Bridger Eocene, but their ordinal position is very doubtful. Cope in 1880 described *Vesperugo anemophilus* from the Wind River Eocene, based on the front of a skull which was never figured or adequately described and appears to have been lost before his full descriptions of this fauna were published. Whether it was really a bat or no will probably never be known. All the later explorations in the American Tertiaries have failed to yield any remains which could be called chiropteran, save for a somewhat doubtful specimen from the Wasatch (undescribed) and the skull which is the subject of this notice.

Zanycteris paleocenus gen. et sp. nov.

Type, Amer. Mus. No. 17180, an incomplete skull from beds at the base of the Wasatch formation, near Ignacio, southwestern Colorado, Upper Paleocene or lowest true Eocene, found by Walter Granger, Amer. Mus. Exped. 1916.¹ The molars and one canine are complete, the premolars broken off. The palate and face are fairly complete and the top of the skull back nearly to the occiput, but the basicranial region is mostly missing.

Generic characters: Dentition ? . 1 . 3 . 3. Incisors not determinable. Canine small, pointed, oval in cross section, not blade-like. Premolars about as large as canine, two-rooted, the crowns not preserved. P² with short diastemata in front of it, slightly spaced behind, its roots connate;

¹ See note upon the stratigraphy of these beds by Mr. Granger in a forthcoming article in this Bulletin.

p^{3-4} somewhat crowded against the molars, the roots more distinctly separated, no inner root on p^4 . First molar large, second smaller, third quite small; their pattern much as in *Stenoderminæ* and *Phyllonycteris*, the crown of m^1 a shallow triangular basin with rugose surface margined externally by a low crest (paracone + metacone) and a distinct almost shelf-like external cingulum; internally the basin is margined by a low protocone, with slight crests extending towards the external angles

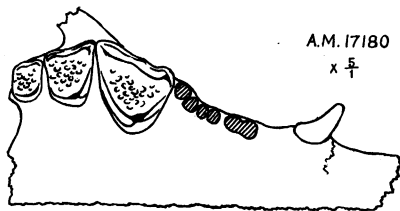


Fig. 1. *Zanycteris paleocenus* gen. et sp. nov.
Right maxilla, palatal view, enlarged to five diameters.

of the tooth, and a somewhat stronger posterointernal cingulum curving upwards at its anterior end to the tip of the protocone. The third molar is quadrate with low crests at inner and outer margins and a broad shallow basin between; the second molar is intermediate in structure between m^1 and m^3 . Muzzle elongated and rather slender in front of the true molars, cranial portion of skull rather short and wide, zygomatic arches probably complete. Braincase of moderate size, sagittal crest low, obscure.

Specific characters: The first molar is quite sharply triangular, somewhat extended backward at the external angle; m^2 more quadrate, and extended forward at the external angle; m^3 is quite small, quadrate, the outer crest low, the protocone ridge higher. The measurements are as follows:

Canine to m^3 , length	8.5
P^2 - m^2 , length	6.5
M^1 - m^3 , length anteroposteriorly	4.3
M^1 , " along outer border	2.3
" width transversely	2.0
M^2 , length along outer border	1.3
" width transversely	1.6
M^3 length anteroposteriorly	0.9
" width transversely	1.0
Width of palate at p^2	4.4
" " " " m^1	8.6

The basicranial portion of the skull is not preserved.

This genus combines characters of the *Stenoderminæ*, *Phyllonycterinæ* and *Sturnirinæ* of Miller's arrangement, showing the peculiar and specialized molar construction characteristic of those three groups; but it does not appear to be close to any living genus and the long slender muzzle and small size of the canine are unusual features for a bat. In the modern

Stenoderminæ the muzzle is either moderately short, or very short; in the Phyllonycterinæ it is longer, but wide in the premolar region; the canine is much larger in both groups. It appears to be reasonably certain that it belongs to the Phyllostomatidæ and to that section of them with specialized frugivorous molars. The great antiquity of the genus suggests that this is a more ancient specialization than would be anticipated, and hints at a very ancient origin for the chiropteran order.

The Phyllostomatidæ are at present all tropical American; a genus from the Phosphorites has been referred to the family, on the inadequate basis of a lower jaw with m_{2-3} preserved.

This is the earliest chiropteran on record. Its highly specialized character and resemblance to modern genera add to the evidence derived from *Pseudorhinolophus*, *Archæopteropus* and other extinct genera that the Chiroptera are a very ancient and early differentiated order, although it gives no light on the date of their adaptation to flying.

This discovery adds one more to the many groups of Mammalia now limited to tropical or South America, but found fossil in the Tertiary of North America. Neotropical families of mammals are generally old Nearctic groups, older than the Holarctic and cosmopolitan families, which have arisen subsequently, and tend to displace their predecessors. Probably these relations would appear equally prevalent in the sub-mammalian groups of animals, and in the plants, if we knew their past history better, or if the correct interpretation were placed upon the distributional data of their existing representatives.

A full description with figures will be published later.

