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A FOSSIL VAMPIRE BAT FROM CUBA

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Of the nine families of bats in the Western Hemisphere, all but three (Desmodontidae, Furipteridae, Thyropteridae) have been known from the West Indies for some time, although the Emballonuridae reach the West Indies only in Grenada. The precise ecology and food habits of the Thyropteridae and Furipteridae are poorly known so that no explanation for their absence other than the presence of water barriers is apparent. The Desmodontidae, on the other hand, are the vampire bats, whose blood diet is well known. The absence of this family from the West Indies might, therefore, be explained by the paucity of native, non-flying, land mammals of which in the Greater Antilles, only five genera are known, none larger than a cat. Chicken-sized or larger ground birds are also absent. Thus it is possible that at the time of arrival of man in the West Indies, there were no animals present which could support a population of vampire bats.

For a number of years, however, it has been known that during the late Pleistocene, several genera of large and medium-sized mammals existed in the Greater Antilles. Four genera of ground sloths are known from Cuba, while elsewhere in the Greater Antilles, both ground sloths and large rodents are known. It therefore appears that at this time a suitable habitat for vampire bats did exist. Until now, however, none of the fossil deposits in which these larger forms are found, at least in Cuba, has yielded bat remains.

During the past 18 years, the Speleological Society of Cuba has made extensive excavations in numerous caves, chiefly in western and central Cuba, uncovering abundant mammal remains, including a great deal of ground sloth material (Arredondo 1955). One of the richest series of fossil deposits was in the Lamas cave, a few miles west of Havana. The following statement was prepared for me by Sr. Oscar Arredondo of the Sociedad Espeleológica de Cuba, Havana, and Sr. Gilberto Silva Taboada, a student of recent bats, also of Havana.

"The Lamas Cave is merely a rocky shelter located in a land slope to the southwest of Santa Fé Beach, on the northern coast of Habana province. On January 21, 1951, an excavation was made at this cave by Oscar Arredondo, Director of the Paleontological Section of the Speleological Society of Cuba, together with Dr. Manuel Rivero de la Calle, from Las Villas Central University.

"According to the stratigraphical profile, the first level was a layer of very dark earth, 60 centimeters in depth, containing plenty of shells and human bones pertaining to the oldest Indian culture of Cuba (the Guanahatabeyes), together with skeletal remains of *Capromys*, *Geocapromys*, and *Boromys offella*. The second level, extending about 40 centimeters in depth, was composed of a red earth completely lacking any bones or archeological remains. The third level was a 30 centimeter deep layer of a light yellow colored earth, containing bones of small extinct rodents, like *Geocapromys*.

"The fourth level, having a depth of 1.40 meters and composed of a humid earth, reddish-yellow in color, was the richest fossil-bearing layer of the trench. Thousands of scattered fragmentary bones and skulls, representing almost all the known extinct Cuban fauna, were unearthed from this level. Here was found a fragmentary bat skull in association with the extinct rodents *Geocapromys columbianus* and *Boromys torrei*, the insectivore *Nesophontes micrus*, the ground sloths *Megalocnus rodens* and *Mesocnus torrei*, an unknown bird allied to the extinct *Phororacos*¹ of Argentina, and also *Testudo cubensis* and the living *Crocodylus rhombifer*."

¹ This identification may be erroneous.

We are here concerned with the richest, deepest, and therefore oldest, of the four layers. This, it may be noted, consists entirely of extinct species, at least as far as the mammals are concerned. I can verify the identity of at least the *Nesophontes*, *Boromys*, *Geocapromys*, and “*Testudo*” (*Geochelone*), since Sr. Arredondo has very generously turned over to me a small sample of the fossils from this layer. The assemblage probably indicates a truly Pleistocene level and the presence of ground sloths (*Megalocnus*, *Mesocnus*) and of large ground birds (whatever their affinities may be) indicate a very different habitat, in terms of ability to support vampire bats, from that which existed in late pre-Columbian times.

As mentioned above, among the numerous fossil bones of this deposit, there was found the rostral portion of a bat skull, which Sr. Gilberto Silva Taboada kindly presented to me. It is now No. 4737 in the Vertebrate Paleontology collection of the Museum of Comparative Zoology. In this specimen, the very characteristic vampire dentition is immediately apparent, together with the peculiar rhombic shape of the palate characteristic of this group of bats. Comparison with the three living species of the family Desmodontidae shows that the fossil is clearly referable to *Desmodus rotundus*, the commonest mainland species.

Unfortunately the condition of the skull permits few measurements to be made on it (Plate). The following are the only standard ones I was able to make. In each case, the figures in parentheses refer to a series of seven specimens of *Desmodus rotundus murinus* from El Pachon, Tamaulipas. Measurements are in millimeters.

Least interorbital width — 5.1 (4.5-5.5)

Length from anterior edge of incisor to posterior edge of canine — 4.9 (4.6-4.9)

Width across base of incisors — 3.9 (3.3-3.7)

Except for the slightly greater width across the incisors, the Cuban fossil appears to be indistinguishable from the Middle American subspecies, *Desmodus rotundus murinus*.

We may assume that *Desmodus* reached Cuba after prey was available in the form of ground sloths and large ground birds, and that when these forms became extinct and thus the ecological

niche for vampires disappeared, the latter also died out in Cuba. The introduction of domesticated animals in post-Columbian times has presumably reopened the niche, but, at least so far, vampires have failed to get across the fairly wide water barriers and hence do not form part of the living bat fauna of Cuba.

In conclusion, I wish to acknowledge the help very graciously given me by the two above-mentioned Cuban naturalists, Sr. Oscar Arredondo and Sr. Gilberto Silva Taboada.

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