

Article XLI.—PRELIMINARY DIAGNOSIS OF AN APPARENTLY
NEW FAMILY OF INSECTIVORES.

BY H. E. ANTHONY.

PLATE XXIII.

In July, 1916, while searching for remains of fossil mammals in Porto Rico, in accordance with the plan for a natural history survey of the Island, a most interesting type of insectivore was discovered. A hint of its presence had been given in 1915 when fragments of two mandibles were sent in with the material collected by Dr. Franz Boas,¹ but this material was too incomplete to give any clue as to the exact nature of the animal. The first satisfactory specimen, a practically complete cranium, was found by the author's wife, Edith I. Anthony, in the Cueva Clara, near Morovis, July 19, 1916. Later, July 29, an abundance of material was secured in a cave more or less well known as the Cathedral Cave (Cueva Catedral) about two miles from Cueva Clara. Owing to the time that will be needed to thoroughly work up the results of this expedition, I am putting this insectivore on record in a preliminary paper with the intention of writing more fully at a later period.

The author desires to express his appreciation of the assistance and valuable counsel given him in the study of this animal by Dr. W. D. Matthew and Dr. W. K. Gregory of the Department of Vertebrate Palæontology and by Dr. J. A. Allen, Curator of the Department of Mammalogy and Ornithology.

Nesophontes² **edithæ** gen. et sp. nov.

Type, No. 14174, Dept. Vert. Pal., from the Cueva Catedral, near Morovis, Porto Rico, July 29, 1916; collector, H. E. Anthony. The type skull is nearly perfect, being broken only at the extreme tip of the premaxillaries and in the auditory region. The bone is dense and hard although brittle from age as is to be expected.

The skull is narrow and elongate, tapering gradually in width from the region of the squamosals to the end of the nasals. The entire superior outline is in practically the same plane, the frontals and parietals being but slightly raised above the nasals and occipital crest. The braincase is subcylindrical and somewhat inflated

¹ For report on this material see Ann. New York Acad. Sci., Vol. XXVII, p. 193.

² *Nesophontes*.—From *νήσος*, island and *φόντης*, a slayer; *edithæ*, in honor of the author's wife, Edith I. Anthony, who found the first skull and directed attention to the presence of the animal.

just back of the orbits. A very low sagittal crest is present and the lambdoidal crest is well developed. The interorbital region shows no noticeable constriction, having parallel margins and a rather flat transverse aspect. The nasal sutures cannot be traced but the rostrum is long and tube-like, being higher than wide. The zygomatic arch is incomplete, lacking the jugal, but the zygomatic roots on both the squamosal and the maxillary are present as distinct processes. There is a pair of well developed infraorbital foramina. The foramen magnum is proportionally very large. The interpterygoid fossa is well developed, being long and deep, but the pterygoid fossæ are reduced to obsolescence. The dentition is essentially of a primitive type and is represented by the formula, I., 3; C., 1; P., 3; M., 3. The incisors of a topotype (the type lacks three incisors) are ranged in nearly parallel rows, only slightly convergent anteriorly, which means that there is a noticeable diastema between the first incisors of each side. These teeth are slightly procumbent, especially the first, which is the largest. All are simple in structure being sharp and subconical. The canine is two-rooted, long and dagger-like, almost straight, and concave on the inner side. The first and second premolars are simple and subequal; the third is submolariform and triangular in cross-section with a high sharp cusp on the outer margin. The three triangular molars all have sharp, well developed cusps, the first two being of equal size, the third rather smaller.¹ The tooth rows along the inner margins are practically parallel from the canine backward. The glenoid fossa is deep and extensive. The auditory region is incomplete in every skull now available and the present evidence is too inadequate to state that this form has or has not an osseous auditory bulla. The palate is shallowly concave and there is a pair of small, separated incisive foramina.

No mandible was found in unquestionable association with the type skull but a lower jaw selected as of proper size to match the cranium gives the following characters. The horizontal ramus of the mandible is curved evenly below throughout its entire length and the ascending ramus is broad and heavy. The coronoid process is prominently developed and there is a conspicuous falciform angular process. The condyle has an unusual aspect due to the oblique ventral position of the articulating surface. The insertion areas for the temporal and pterygoid muscles are well defined. The lower dentition is similar to the upper (I., 3; C., 1; P., 3; M., 3) with the exception that the last premolar is simple, not submolariform; there is probably no diastema between the first incisors of each side, and the molars are of typical tuberculo-sectorial form. The teeth of the lower row are well in contact with one another. There are two anterior dental foramina below pm_2 and pm_4 , respectively.

Measurements.—Greatest length of cranium, 41 mm.; greatest breadth (across zygomatic roots on squamosals, 17 mm.; greatest breadth of braincase, 14.5 mm.; interorbital breadth, 8.5 mm.; width of rostrum (back of canines), 6.5 mm.; length of maxillary molar series, 12.5 mm.; greatest transverse extent of m^1 , 3 mm.; palatal width at pm^4 , 5 mm.; length of mandibular molar series, 13.5 mm.; greatest length of mandible, 28 mm.

There appears to be a great difference in size between sexes, unless later research establishes more than one species, the male presumably being the larger, and if this assumption proves correct, the type is a female. The type

¹The details of the dentition will be more fully treated in the paper to follow.

skull shows evidence of full maturity. Among the topotype material considerable individual variation is shown, some of the variation being correlated with the size difference and consequently may be due to sexual differentiation. Such a variation is the much greater development of the lambdoidal crest in a large skull fully fifty per cent larger than the type. The teeth do not apparently change much with wear, sharp cusps being prominent in every instance.

Nesophontes has no evident close relationships with any known genus. Its characters are so strikingly different and of a nature so important that full justice may be done them only by the erection of a new family. The Porto Rican animal is a true insectivore, thus removing at once from consideration any member of the Carnivora or Creodonta to which groups some of the characters might prompt one at first to turn.

Among the Insectivora the characters of the dentition alone are sufficient to exclude the entire section of the Zalambdodonta¹ while for the same reason the Leptictidæ may not include *Nesophontes*. All the Zalambdodonta have specialized or modified incisors and canines contrasting with the primitive condition of these teeth in *Nesophontes* and also have a reduced metacone, the cusp that in *Nesophontes* is high and V-shaped.

From the Erinaceidæ *Nesophontes* is excluded by having tritubercular instead of quadritubercular upper molars, by normal or primitive instead of specialized incisors and canines, by the reduced number of premolars, 3 in *Nesophontes*, 4 in the Erinaceidæ, and by the loss of the zygomatic arch.

Compared with the Tupaiidæ, *Nesophontes* differs in the possession of molars with V-shaped metacone only, instead of both metacone and paracone, while the incisors and canines of the Tupaiidæ are much more specialized than in *Nesophontes*. In addition the latter lacks the postorbital ring and greatly expanded braincase of the Tupaiidæ.

Detailed characters well separate *Nesophontes* from the Eocene insectivores (figured in the 'Carnivora and Insectivora of the Bridger Basin' by Dr. W. D. Matthew) and will be fully set forth in a later paper.

Nesophontes may not be included with the *Talpidæ* because of the uninflated condition of the auditory and basicranial regions, so expanded in the *Talpidæ*, the primitive form of the skull, as opposed to the flattened and swollen braincase in the *Talpidæ*, and the far less specialized character of the incisors, canines, premolars and molars, which latter lack the long crowns, sharp V-shaped paracones and inwardly projecting metacones found in the *Talpidæ*.

¹ For convenience the Zalambdodonta is taken to include the families Centetidæ, Potamogalidæ and Solenodontidæ, the Necrolestidæ and Chrysochloridæ being so very different in structure that they do not enter into consideration.

From the Soricidæ, *Nesophontes* is sufficiently differentiated by the non-falcate form of the upper incisors, by the normal or primitive form of the lower incisors, by the normal form of the canines, by the unreduced premolar series, by the lack of the postero-internal spurs found on the shrew molar, and by the large size of the last upper molar. The general contour of the skull is much less specialized than that of the shrew skull. However, the affinities of *Nesophontes* appear, on the whole, to connect the Nesophontidæ more closely to the Soricidæ than to other families.

Nesophontidæ fam. nov.

To summarize, *Nesophontes* represents a distinct family, apparently hitherto unknown, characterized by the combination of the following important structures.

Nearly complete, primitive dentition in parallel, closed rows. I., $\frac{3-3}{3-3}$; C., $\frac{1-1}{1-1}$; P., $\frac{3-3}{3-3}$; M., $\frac{3-3}{3-3}$; = 40. Canines in normal position, normally developed, two-rooted. Incisors smaller than canines with median diastema above. Upper molars triangular in cross-section, asymmetrically cusped, with V-shaped metacone but no paracone. Lower molars of extremely primitive tuberculo-sectorial type.

Zygomatic arch incomplete, malar absent, zygomatic roots peg-like.

Skull elongate, narrow, braincase but little expanded.

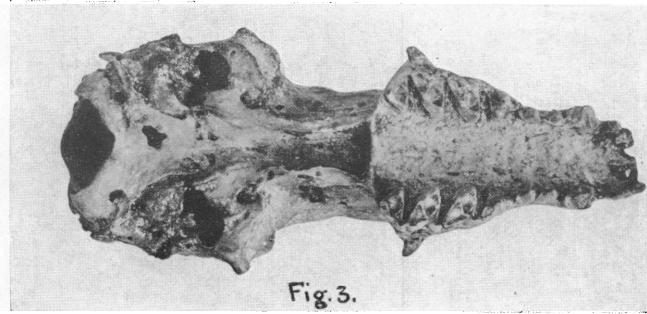
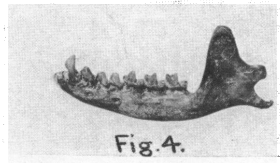
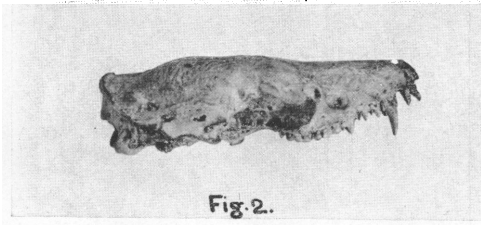
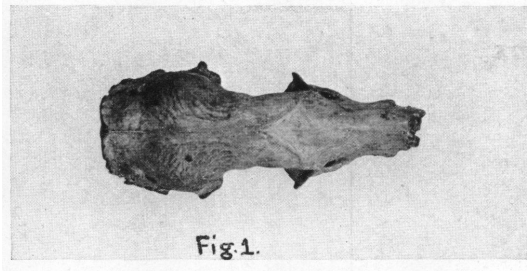
Basicranial region moderately elongate antero-posteriorly.

Palate completely ossified.

Pterygoid fossæ much reduced.

Mandibular condyle slightly oblique to the transverse plane, the articulating surface directed downward.

Judging from associated forms *Nesophontes* must have lived at least up into the late Pleistocene as mingled with the bones of this insectivore were found the remains of several genera of bats some of which are living on the island today, the species even being identical.



NESOPHONTES EDITHÆ sp. nov.

Figs. 1, 2 and 4, natural size. Fig. 3 enlarged to about twice natural size, to show dentition.

