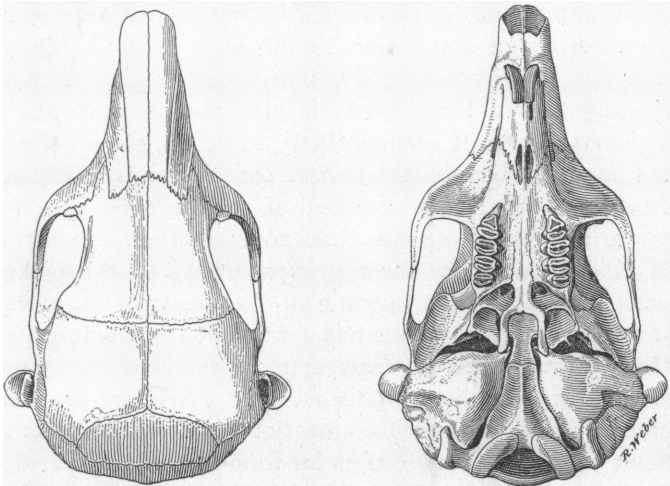


**Article IX. — THE EXTERNAL EAR BONE IN CERTAIN RODENTS.**

By J. A. ALLEN.

My attention was recently called by my assistant, Mr. F. A. Schneider, to a skull of *Liomys canus* Merriam which showed a singular bony appendage attached by a ligamentous hinge to the front lower border of the left meatus auditorius, it having attracted his notice, in cleaning the skull, as something out of the ordinary. As he had several other skulls of this species to prepare, I urged him to take great care to save this appendage in situ. As a result he found it on one or both sides of several of the remaining skulls, including the one here figured.

This external ear bone is situated at the front lower border of the meatus and is hinged to it by ligament; it has the



Skull of *Liomys canus* Merriam, showing external ear bones. No. 20905, Am. Mus. Nat. Hist., ♂ ad. Twice nat. size.

form of a truncated oval or crescentic appendage, quite large and prominent, as shown in the accompanying figures. Although hinged and moveable, the range of movement is from

the vertical forward; it cannot be pressed backward to close the meatus without breaking the ligamentous hinge, but can readily be flexed forward through a wide angle. Its function therefore seems to be to prevent the closing or partial closing of the meatus by the soft parts of the ear. The external ear is not large, in this group, for the size of the animal, as is the case in *Chinchilla*, where it also exists, so that this appendage is not necessarily correlated with a large external ear, nor even with greatly developed audital bullæ. This bone is of very dense structure, and is evidently developed from an independent center of ossification.

On examination of alcoholic specimens of *Liomys bulleri* (Thomas), *Heteromys anomalus* (Thompson), and *Heteromys jesupi* Allen, I find this appendage to be well developed in each of these species, as it doubtless is in all the members of the *Heteromys* (including *Liomys*) group. But I could find no trace of it in the only species of *Perognathus* of which alcoholics are available for examination. In the larger species of *Perognathus*, as in the *hispidus* and *penicillatus* groups, there seems to be a functional equivalent in the building up of the anterior border of the bony meatus into a slightly projecting lip. I have found it also absent in *Zapus* and *Proechimys*, where it seemed likely to occur; but in the case of the latter the base of the external ear forms a firm cartilaginous tube. A glance at the skull of a *Dipodomys* or a *Perodipus* is sufficient to show that no equivalent modification need be looked for in these groups, owing to the posterior position and backward opening of the meatus. Anatomical examination of these forms has confirmed this assumption.

This structure does not appear to be mentioned in general works on mammalian anatomy, but there are incidental references to it in other connections—just how many is difficult to trace. I have thus far found only the following:

In 1890 the late Dr. G. E. Manigault, of Charleston, South Carolina, reported (Proc. Elliott Soc. Nat. Hist., May, 1890, pp. 237-239) the discovery of a "crescent-shaped flat bone occupying the anterior half of the outer edge of the external meatus of the ear," in *Chinchilla lanigera*, and gave figures

of it. He being unable to find any published account of such a structure, either in the Chinchilla or other mammals, wrote to various leading mammalogists and comparative anatomists on the subject but succeeded in obtaining no very definite information. Mr. G. B. Howes of London, in reply to his inquiries, stated that he was familiar with it, and "with its like in other Hystricomorpha. There are two such in *Cavia*, and I believe them to be ossifications of the cartilaginous meatus externus." Mr. Howes further stated that he knew of no published description of this bone. Mr. Oldfield Thomas, in replying also to Dr. Manigault's inquiries, said: "Like him (Mr. Howes) I have seen the extra ear bone myself, but cannot remember where there is a description of it. I have, however, a strong impression that I have seen it described somewhere, but by whom, and in what particular animal I cannot recall."

I had likewise searched carefully for some published account of this interesting feature, but had been able to find only that given by Dr. Manigault, as cited above, until my attention was called by Prof. W. B. Scott, the eminent palæontologist, to a paper by Dr. W. Peters on the genus *Pectinator*, wherein it is mentioned.

Dr. Peters, in describing the skull of *Pectinator* (Trans. Zoöl. Soc. London, VII, Pt. V, 1871, p. 401) states: "The tympanic bullæ are also comparatively larger than in *Ctenodactylus*; but the meatus auditorius externus has the same direction, and is in the same manner elongated by an inferior semiannular osseus appendage, as in *Ctenodactylus*." Dr. Peters's figure of this appendage (*l. c.*, pl. 49, fig. 3) shows that it closely resembles, in size and form, the same structure in *Heteromys*.

Mr. Wm. Yarrell, many years before, gave an account of the anatomy of *Ctenodactylus massonii* Gray (P. Z. S., 1831, p. 44), in which he says: "The *meatus auditorius* is elongated, forming a tube 2-10ths of an inch in length on the inferior surface and lined with a dense pigment." But he says nothing of this elongation being produced by the development of a separate ossicle

Doubtless other cases are on record, but those above cited indicate that this structure occurs in several widely separated groups of Rodents.

In species in which this structure exists, it is not likely to be met with attached to the skull in Museum specimens, since, owing to its nature and position, it would naturally be removed or mutilated by the collector in taking off the skin, attached to which it may doubtless be occasionally detected by careful examination.