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### XXXIV.—On the classification of the Cavies

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Within *Euryzgomatomys* I now find it possible to distinguish from the true Paraguayan *spinosus* the form found in Santa Catherina as follows :—

*Euryzgomatomys catellus*, sp. n.

General colour and other external characters as in *E. spinosus*, except that on the under surface the white area is much reduced in extent. In *spinosus* the whole under surface from chin to inguinal region is white, and this colour extends nearly or quite over the whole breadth of the belly, where it grades, without very sharp line of demarcation, into the buffy or drab of the flanks. In *E. catellus*, on the other hand, the chin and throat are suffused with brownish, there is a marked brown patch in the middle of the chest, and the white of the belly is reduced to a comparatively narrow median area owing to the encroachment on it of the brownish or drabby flank-colour, from which its line of demarcation is somewhat abruptly defined.

The skull is, on the whole, similar to that of *E. spinosus*, except that the **V** of the palatal notch is less excessively narrow and pointed, and does not extend quite so far into the palate—at most to the posterior third of  $m^2$ , and more often only to the hinder edge of that tooth.

Dimensions of the type (measured on the spirit-specimen before skinning):—

Head and body 245 mm. ; tail 53 ; hind foot 35 ; ear 18.

Skull : greatest length 49 ; condylo-incisive length 46·2 ; zygomatic breadth 27·3 ; nasals  $14\cdot3 \times 6\cdot5$  ; interorbital breadth 11 ; palatilar length 19·2 ; upper tooth-series 10.

*Hab.* Santa Catherina. Type from Joinville.

*Type.* Adult male. B.M. no. 9. 11. 19. 30. Collected by W. Ehrhardt. Four specimens.

I have provisionally used a binomial name for this animal ; but intermediate forms may prove to exist in the little-known country between its type-locality and that of *E. spinosus*, and it will then have to be regarded as a subspecies.

XXXIV.—On the Classification of the Cavies.

By OLDFIELD THOMAS.

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MR. WILFRED OSGOOD has recently published a suggested revision of the classification of the Cavies\*, and has divided

\* Field Museum Publ. Zool. x. p. 194 (1915).

them into two genera, one of these being subdivided into three subgenera. He recognizes the genus *Kerodon*, including *K. rupestris* only, as distinct from *Cavia*, mainly on account of its peculiar sternum and other skeletal characteristics, while within the large genus *Cavia* he only gives subgeneric importance to the molar characters usually used to distinguish *Cavia* s. s. from the other forms with teeth like those of *Kerodon*, which have generally been included in the latter genus.

Among these, again, he has discovered a character in the complete interruption of the maxillary in front of the lacrymals, to distinguish *Galea* (*musteloides*, *boliviensis*, *spixi*, &c.) from *Cavia* s. s. (*porcellus*, *aperea*, &c.) and "*Caviella*" (*australis*, *manas*, &c.).

In naming some specimens recently received, I have had occasion to examine Mr. Osgood's classification, which is clearly a distinct advance in the matter, though I would venture to propose some amplification of it.

Mr. Osgood's sections, whether called genera or subgenera, are all clearly defined natural groups, easily distinguished from each other by definite characters, and I would, therefore, suggest that they should all be treated as genera.

In addition, I would erect a special genus for my *Cavia niata*, which is quite a specialized form, readily distinguishable from the other members of *Caviella*, in which Mr. Osgood includes it.

The following is a synopsis of the genera, the characters not being in any way detailed, as such of them as have not been published by Waterhouse and other earlier writers have been well described by Osgood:—

A. Cheek-teeth complicated, as indicated by

Waterhouse \*, pl. vi. fig. 9 ..... 1. *Cavia*, Linn.

Genotype, *C. porcellus*, L. Other species: *C. aperea*, Erxl., *rufescens*, Lund, *cutleri*, Benn., *atahualpa*, Osg.

B. Cheek-teeth comparatively simple (cf. Waterhouse, pl. vi. figs. 1-8).

a. Toes with claws. "Sternum broad and flat" (Osgood).

a<sup>2</sup>. Skull shortened, bowed. Incisors unpigmented. Orbital branch of maxillary continuous as a narrow strip in front of lacrymals.

a<sup>3</sup>. Incisors nearly vertical, their angle to the line of the molars, measured as described in the footnote †, about 100°.

\* Nat. Hist. Mamm. ii. (1848).

† When publishing the method of obtaining this important angle (J. Bombay N. H. Soc. xxiv. p. 408, footnote, 1916), I took it from the terminal part of the enamel-covered front of the tooth, believing that in

$M^3$  more complicated, with heel long and separated from the rest of the posterior lobe by a deep notch . . . . . 2. *Caviella*, Osg.

Genotype, *C. australis*, Geoff. & D'Orb. Other species: *C. mænas*, Thos.

$b^3$ . Incisors much thrown forward, their angle with the line of the tooth-row about  $115^\circ$ .  $M^3$  less complicated, the heel a mere short triangular projection, without internal notch . . . . . 3. *Monticavia*, g. n.

Genotype, *M. niata* (*Cavia niata*, Thos.). Other form: *M. niata pallidior*, Thos.

$b^2$ . Skull not specially shortened. Incisors pigmented, directed backwards, their angle about  $85^\circ$  with the line of the tooth-row. Orbital branch of maxillary completely interrupted by lacrymal . . . 4. *Galea*, Meyen.

Genotype, *G. musteloides*, Meyen. Other species: *G. boliviensis*, Waterh., *auceps*, Thos., *spixi*, Wagl., *flavidens*, Brandt, *wellsi*, Osg., *pallustris*, Thos.

$b$ . Toes with nails. Skeletal characters described by Osgood (*l. c.*) . . . . . 5. *Kerodon*, F. Cuv.

Genotype, *K. rupestris* (*Cavia rupestris*, Wied).

this way a more exact measurement might be obtained. But this involves the anomaly that teeth which appear to the eye approximately vertical have a measured index of about  $75^\circ$ , instead of  $90^\circ$ , while teeth with a measured angle of  $90^\circ$  are in reality what one calls "thrown forward." The object of all such measurements being to give a more exact method of expression to eye-judgments, I would propose now to alter the measurement, to make it more in conformity with the general impression.

This may be done by adjusting one limb of the goniometer to the chord of the curve shown in side-view by the whole exposed part of the tooth, from the highest external corner where it issues from the bone to the tip of the tooth. The other limb is then adjusted parallel with the tooth-row, this being easily done by eye, and the resulting angle read off.

As explained before, specimens with properly developed incisors, neither pulled out nor pushed in, are necessary, and it is also essential that the examples should be without imperfections in the bone at the point where the incisors leave it.

The resultant angles are all, of course, considerably higher than before, and I now give the angles in the same animals measured in the revised way. *Rattus listeri* comes out at  $52^\circ$  instead of  $26^\circ$ – $28^\circ$ , *R. rattus*  $70^\circ$ – $80^\circ$ , *R. berdmorei* about  $100^\circ$ . *Rhizomys*  $82^\circ$ – $87^\circ$ , *Nyctocleptes*  $97^\circ$  or  $98^\circ$ , *Bathyergus* about  $105^\circ$ , *Cannomys*  $112^\circ$ – $115^\circ$ ; while in the most extreme form of all, *Helicophobius*, the angle is about  $130^\circ$ . A Canadian beaver stands at  $90^\circ$ , a *Cynomys* at  $95^\circ$ , and an *Ondatra* at  $96^\circ$ .

As before, a fairly large limit of error must be allowed; but this does not seem to be greater in the new way, which undoubtedly gives a truer idea of the angle at which the incisors are set.

Instead of a goniometer, a simple protractor may be used, and the angle judged by eye; but in that case the limits of error would undoubtedly be larger. Even then, however, there is a gain in exactness as compared with the old vague statements of "incisors thrown forward" or "directed backward," without any effort at measurement at all.