

MEM. NAT. MUS. VICT., IX, 1936.

AN EXTENDED DESCRIPTION OF *PSEUDOMYS*
NOVAE-HOLLANDIAE, WITH REMARKS ON ITS
AFFINITY TO *P. HERMANNBURGENSIS*.

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(Plate II.)

The following description is based on a series of 27 animals which were collected by W. Blandowski near the junction of the Murray and Darling Rivers in 1857. Two specimens from the series were recently sent to the British Museum of Natural History, South Kensington, and I am indebted to Mr. M. A. C. Hinton, Deputy-Keeper of Zoology, for comparing them with the type. They were found to be in perfect agreement.

Pseudomys (Leggadina) novae-hollandiae (Waterhouse).

Mus novae-hollandiae Waterhouse, Proc. Zool. Soc., p. 146, 1842;
Gould, Mamm. Aust., iii, pl. xxii, 1863; Ogilby, Aust. Mus. Cat.
No. 16, Aust. Mamm., p. 109, 1892.

Pseudomys (Gyomys) novae-hollandiae Thomas, Ann. Mag. Nat. Hist.,
(8), vi, p. 607, 1910.

Size small. General colour about buffy brown pencilled with darker hairs on the back. Dorsal fur (9-10 mm.) slate grey for three-fourths of its length, then wood brown with darker tips. Long black hairs numerous. Sides of body and outer sides of limbs lighter. Head as body; cheeks lighter, upper lip white. Mystacial vibrissae dense, long (24 mm.); black with a few anterior hairs white. Ears long, oval in outline; inner surface almost naked, outer surface clothed with dark brown adpressed hair. Ventral surface and inner side of limbs soiled buffy-white. Line of demarcation sharply marked. Ventral fur basally grey for half its length, the tint being lighter on the chest and throat than on the lower part of the body. Tail about as long as head and body; white below except towards the tip where it is uniformly brown; clothed with stiff hairs which are not sufficiently numerous to hide scales. Scales about 15 to centimetre. Manus and pes buffy white; sparsely covered with adpressed hair which barely hides the skin.

Skull.—All skulls in the series have the occipital region cut away. The braincase is smooth and rounded and the anterior edge of the zygomatic plate almost vertical and very slightly concave.

Teeth.—Laminae slightly tilted. First molar with an antero-internal cingular cusp which in some specimens is well marked but in others less so.

Dimensions of Skin.—Head and body, 75 mm.; tail, 74 mm.; hind foot, 19 mm.; ear, 15·8 mm.

Dimensions of Skull.—Back of parietals to tip of nasals, 20 mm.; nasals, 7·5 × 2·3 mm.; interorbital breadth, 3·5 mm.; palate length, 12·3 mm.;

palatal foramina, 4.3 mm.; breadth outside M², 5.5 mm.; breadth inside M², 2.5 mm.; upper molars, 3.5 mm.

Pseudomys hermannsburgensis was described by Waite (1) from specimens taken on the Horn Expedition to Central Australia in 1895. In 1932 Troughton (2) described a subspecies, *P. hermannsburgensis bolami*, from Ooldea, South Australia, its distinguishing characters being longer feet and ears, and less warm colouration.

Amongst the Murinae in the National Museum are about 100 specimens of this species, a little more than half of which were collected at Ooldea. The remainder are from Hermannsburg (co-types), Charlotte Waters, Barrow Creek and unspecified localities in Central Australia. Amongst this large number there is a good deal of variation in general size, and in the length of ear, pes and tail. So generalized is it, however, that it is impossible to correlate the mice into geographical races. Groups of mice, taken in the same place at the same time, show up to three millimetres difference in length of ear and pes, and from the same locality an earlier or later collection may similarly vary around a smaller or larger general average. The cause of this variation is the irregular rainfall, which is an outstanding feature of the arid regions of Australia. After several years of drought the mammal population is poor and stunted. With good rain comes an abundance of food, fertility increases and young born during this period grow to larger proportions.

The following figures are based on measurements of adults,

Species	Specimens measured	HIND FOOT		EAR		TAIL (expressed as per cent. of head and body)	
		variation mm.	average mm.	variation mm.	average mm.	variation	average
<i>hermannsburgensis</i> Central Australia	23	15.5 to 19.5	17.8	12 to 16.5	14	101% to 123%	113%
<i>hermannsburgensis</i> South Australia	32	16.8 to 20	18.3	13 to 16.5	14.6	98% to 150%	112%
<i>novae-hollandiae</i>	19	16.5 to 19.5	18	13.5 to 16.5	14.9	86% to 111%	100%

all specimens suspected of immaturity being excluded. The ear measurement is taken from the notch at the base of the concha to the extreme tip.

Skulls.—The variation in skulls of *hermannsburgensis* from the two localities is similar; it is not possible to find any character that will separate them, as all measurements overlap.

Colour of pelage.—Whilst the general tone of the South Australian *hermannsburgensis* is, on the whole, slightly colder than in Central Australian examples, the intergrading is so complete and so widely overlapping that it is of no practical use as a distinguishing character.

Comparison of *hermannsburgensis* with *novae-hollandiae*.

The generic name *Pseudomys* (Gray, 1832) was revived by Oldfield Thomas (3) in 1910, when he separated the Australian mice from other forms. He divided the genus into four subgenera, *Pseudomys* s.s., *Thetomys*, *Leggadina* and *Gyomys*. He placed *hermannsburgensis* in *Leggadina*, of which he said:

“Size small. Form of skull normal. Anterior zygomatic plate straight or convex in front as in ordinary murines. Palatal foramina narrow. Pterygoid region peculiar, the parapterygoid fossae broad and very shallow, scarcely hollowed at all, the ectopterygoids bordering it externally low, flat, not or scarcely raised up above the level of its floor; entopterygoids also much lower and less projecting than usual. Molars very variable, but always with a well-marked antero-internal cingular cusp on M¹. In *P. delicatulus* this is small, in *hermannsburgensis* intermediate, and in *foresti* very large. In proportion to the development of this cusp the laminae are themselves tilted backwards internally whilst the outer cusps are reduced in size.”

He also designated *novae-hollandiae* as the type of *Gyomys* of which he said:

“Size small. Skull as in *Leggadina*. Molars quite normal; no anterior cingular cusp on M¹, and the molar laminae quite of the usual murine shape and position.”

Skull.—Though the available skulls of *novae-hollandiae* have the basi-occipital and pterygoidal regions cut away, those measurements which can be taken are completely within the limits of variation in *hermannsburgensis*. The general conformation, and the shape of the front edge of the zygomatic plate, also, is identical. This is in accordance with Thomas's description quoted above.

Teeth.—The cingular cusp of *hermannsburgensis* actually varies to a considerable degree (see pl. II). M^1 , in some specimens, shows well-marked convexity of contour at the base of the cusp, whilst in others this is almost absent. The teeth of *novae-hollandiae* resemble those of *hermannsburgensis* in shape, and in tilting of laminae. The cingular cusp is variable, and is indistinguishable in its variation from that of the latter species.

Colour of pelage.—Though *hermannsburgensis* is generally warmer in tone than *novae-hollandiae* the colours intergrade, and a specimen of the former species from Barrow Creek, Central Australia, is a perfect match for the average tone of the latter.

Conclusions.

On the above facts it will be seen that there is no good reason for separating the Central and South Australian forms of *hermannsburgensis*. The approximation of their average measurements, together with the variation found in each, makes it impossible to differentiate between them.

It is also clear that *novae-hollandiae* and *hermannsburgensis* are very closely allied. Length of tail is the only feature in which they differ consistently. Other measurements and colour intergrade so completely that there would seem to be little reason for separating them, except difference in length of tail and possibly geographical distribution.

The teeth of *novae-hollandiae* agree more closely with the characters described for *Leggadina* than with those for *Gyomys*, and there is no doubt that it must be assigned to that subgenus.

Finlayson (4) has already expressed a doubt as to the constancy of Thomas's subgeneric characters, and suggested that his (Thomas's) division was intended as a tentative step only. Whether the latter suggestion is, or is not, correct, the variability of many skull and teeth characters must be admitted. Owing to the fact that considerable numbers of specimens are needed to explore fully the variation of cranial and dental characters, it is probable that no single institution has the necessary material for a complete revision of the genus. It is therefore urged that museums possessing extensive series, even of a single species, should publish a critical survey, so that the whole can later be correlated and a much-needed revision undertaken on reliable evidence. Until such time

as this is done it would seem better to continue with the present division, and it is suggested that in place of the deposed *novae-hollandiae*, the oldest remaining species, *albo-cinereus* Gould, 1845, be elected as the genotype of the *Gyomys* group.

REFERENCES.

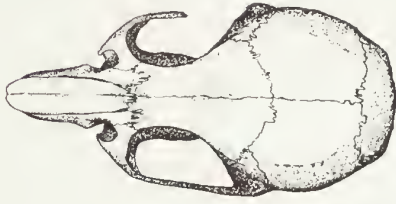
1. Edgar R. Waite. Report of the Horn Scientific Expedition to Central Australia: Muridae. Pt. II, p. 405, 1896.
2. E. Le G. Troughton. On two New Rats of the Genus *Pseudomys*. Records of the Australian Museum, xviii, p. 292, 1932.
3. Oldfield Thomas. The Generic Arrangement of the Australian Murines hitherto referred to *Mus*. Ann. and Mag. Nat. Hist., (8), Vol. vi, p. 605, 1910.
4. H. H. Finlayson. Preliminary Descriptions of Two New Mammals from South Australia. Trans. Roy. Soc. S. Aust., Vol. lvi, p. 170, 1932.

EXPLANATION OF PLATE II.

Fig. 1. *Pseudomys (Leggadina) hermannsburgensis* Waite.

Fig. 2. *Pseudomys (Leggadina) novae-hollandiae* (Waterhouse).

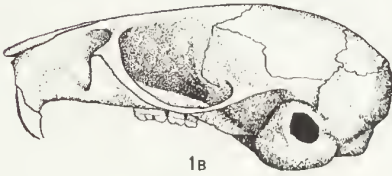
a, dorsal view of skull, $\times 2$; *b*, lateral view of skull, $\times 2$; *c*, ventral view of skull, $\times 2$; *d* and *e*, first molar tooth, showing variation of cingular cusp, $\times 15$.



1A



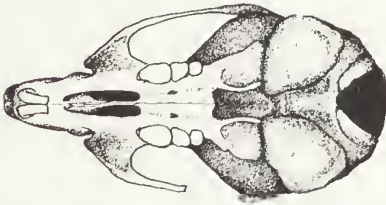
2A



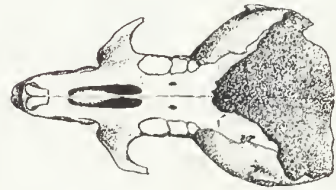
1B



2B



1C



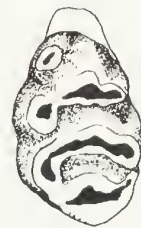
2C



1D



1E



2D

C.W.B.

1 a-e. *Pseudomys (Leggadina) hermannsburgensis* Waite
2 a-d. *P. (L.) novae-hollandiae* Waterhouse